

# 2020 Census Item Nonresponse and Imputation Assessment Report

*A New Design for the 21st Century*

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Prepared by Jessica DeJesus and Sarah Konya

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## Executive Summary

This assessment presents the item nonresponse (INR) and imputation rates for household-level and person-level items from the 2020 Census. The items include population count, undercount, tenure, telephone number, relationship, sex, age/date of birth, Hispanic origin, race, and overcount. A “population count only” metric is also included in the assessment. “Population count only” occurs when the respondent provides the household population count, but does not provide responses for the household-level items nor the person-level items for any person on the roster.

Item nonresponse and imputation rates are response data quality metrics. Item nonresponse occurs when a respondent provides some information but does not respond to all census questions. Item nonresponse rates are calculated before preediting or characteristic imputation and do not take into consideration the validity of a response. Imputation is a statistical technique used to fill in missing information and considers both respondent cooperation and response validity. Assignment and allocation are two types of imputation. Assignment occurs when a response is either missing or not consistent with other responses and an item value can be determined based on other information provided for that same person or household. Allocation occurs when a response is either missing or not consistent with other responses and an item value cannot be determined based on information provided for that same person. An allocation will be assigned to the individual from another person within the housing unit (HU) or group quarters (GQ) or from a person in a nearby HU/GQ.

The key results from this assessment are described below:

### **Item Nonresponse:**

#### **Overall Self-Response (Type of Enumeration Area [TEA] 1 and 6):**

INR rates for most items were lowest for households that self-responded compared to enumerator or group quarters returns. For the internet self-response mode, rates ranged from 0.2 percent for the telephone number question to 2.7 percent for the overcount question. Internet had the lowest INR rates for the tenure, telephone number, Hispanic origin, race, and relationship questions. Phone had the lowest rate for undercount at 0.6 percent. Paper had the lowest INR rates for sex, age, overcount, and population count only. The highest INR rates for the self-response modes occurred in the bilingual paper returns for the undercount and race items, which had values greater than 19 percent.

#### **Enumerator Returns:**

The Coverage Improvement operation had the lowest INR rates among enumerator returns, with the highest INR rate being 5.7 percent for the Hispanic origin question. The highest INR rates for Nonresponse Followup (NRFU) Production and NRFU Reinterview (RI) were telephone number at 56.9 percent and age/date of birth at 28.4 percent.

### **Group Quarters (GQs):**

Group quarters enumerations had relatively high INR rates. For GQs overall, all items had rates greater than 17.8 percent, with Hispanic origin having the highest INR rate at 43.9 percent. Results between two main GQ types, institutional and noninstitutional, were also compared. Institutional GQ types include correctional facilities for adults, juvenile facilities, nursing facilities, and other institutional facilities. Noninstitutional GQs include college or university housing, military quarters, and other noninstitutional facilities. Institutional GQs had lower INR rates compared to noninstitutional GQs. The lowest INR rate was 3.2 percent for the sex question for correctional facilities for adults and the highest INR rate was 76.6 percent for the Hispanic origin question at military quarters.

### **Imputation:**

#### **Overall Self-Response (TEA 1 and 6):**

The imputation rates (assigned plus allocated) for the internet self-response mode ranged from 0.7 percent for tenure to 3.3 percent for age/date of birth. In fact, the internet self-response mode had the lowest imputation rates for every question except for sex. The imputation rates for phone ranged from 1.0 percent for sex to 5.8 percent for age/date of birth. The imputation rates for paper ranged from 0.9 percent for sex to 7.5 percent for relationship.

#### **Enumeration Returns:**

Coverage Improvement had the lowest imputation rates for tenure, sex, and age/date of birth, while Rural Alaska had the lowest imputation rates for Hispanic origin, race, and relationship. The lowest imputation rate for NRFU was the sex item at 9.3 percent. Age/date of birth had the highest imputation rates for every enumerator mode except Coverage Improvement and Administrative Record (AR) enumerations.

#### **Group Quarters:**

For GQs overall, sex had the lowest imputation rate at 22.0 percent, and Hispanic origin had the highest imputation rate at 46.2 percent.

### **Comparisons Between the 2010 and 2020 Censuses:**

#### **Item Nonresponse:**

Overall, the 2020 Census had higher INR rates than the 2010 Census for all items, except for population count and undercount. For self-response returns, 2020 had lower item nonresponse rates for all items, except for age/date of birth, overcount, and relationship. 2020 Self-Response INR rates were low, ranging from 0.7 percent for population count to 2.6 percent for race. Within enumerator returns, 2020 had higher INR rates for all items except for undercount and population count. For GQ enumerations, 2020 had higher INR rates than 2010 for all items.

**Imputation:**

The 2010 Census had lower imputation rates than the 2020 Census for all items overall, within enumerator returns, and for GQ enumerations. For self-response returns, 2020 had lower imputation rates than 2010 for tenure, sex, Hispanic origin, and race.

**Recommendations:**

- **Continue to implement the use of soft edits in the internet instrument.** The introduction of the internet instrument in 2020 likely contributed to low self-response INR rates because of the soft edits. The soft edits reminded people to provide a response if they attempted to skip a question.
- **Research how to increase unit response and decrease item nonresponse.** Populations residing in group quarters are challenging to enumerate. In 2020, the COVID-19 pandemic further added to enumeration difficulties and was probably an important factor contributing to the high GQ item nonresponse.



## 1. Introduction

The purpose of this assessment is to present the item nonresponse (INR) and imputation rates for household- and person-level items from the 2020 Census. The items include population count, undercount, tenure, telephone number, relationship, sex, age/date of birth, Hispanic origin, race, and overcount. A “population count only” metric is also included in the assessment. “Population count only” occurs when the respondent provides the household population count, but does not provide responses for the tenure, undercount, sex, age/date of birth, Hispanic origin, race, relationship, and overcount items. INR and imputation rates are calculated for self-response modes, enumerator operations, and group quarters operations. This assessment also compares the INR and imputation rates between the 2010 and 2020 censuses across modes and operations.

Note this assessment will not address the quality of the imputation process; it will only measure how much imputation was done. Characteristic imputation, applied after the household population is established, is in scope for this assessment; count imputation is not in scope.

### 1.1 Operational Changes Resulting from the COVID-19 Pandemic.

- The COVID-19 pandemic may or may not have impacted unit response rates, which then would have an impact on INR rates and the amount of characteristic imputation needed. Also, the pandemic may have made people more hesitant to speak to an enumerator face to face, so our unit responses may have been lower and our INR rates may have been higher.
- The mailing materials were delayed because of the pandemic, which then resulted in:
  - The timing between Mailing 2 and Mailing 4 being longer than initially planned.
  - The USPS experiencing mail delays during the census, perhaps impacting the originally estimated in-home mailing dates.
  - Two additional mailings (Mailings 6 and 7) being sent to nonresponding households that were not planned in the original mailing strategy.
- The Update Leave (UL) operation was delayed, which likely reduced the UL self-response rate.
- Field enumeration operations were delayed.

## 1.2 Schedule

A subset of key activities and milestones for the Item Nonresponse and Imputation Assessment Report from the final baselined version of 2020 Census Integrated Master Schedule appears below.

Table 1. Key Activities and Milestones from the Item Nonresponse and Imputation Assessment Report

Activity or Milestone Name	Planned Start	Actual Start	Planned Finish	Actual Finish
Receive, Verify, and Validate Item Nonresponse Rate Assessment Data	6/25/2021	7/1/2021	6/25/2021	7/1/2021
Evaluations and Experiments Branch distributes Final Draft Item Nonresponse and Imputation Assessment Report to the DROM Working Group for electronic review	8/15/2022	9/6/2022	8/15/2022	9/6/2022
Decennial Communications Coordination Office (DCCO) Staff Formally Release the FINAL Item Nonresponse Rate Report in the 2020 Census Program Internal Memorandum Series	11/14/2022	11/15/2022	11/14/2022	11/15/2022

Source: U.S. Census Bureau, 2020 Census, Integrated Master Schedule.

## 2. Background

Item nonresponse and imputation rates are operational quality metrics used to identify missing responses by mode. This section provides an overview of these metrics and previous analyses of missing responses from census tests.

### 2.1 Item Nonresponse and Imputation Overview

Both item nonresponse rates and imputation rates are useful in determining quality of items and quality of responses to those items, but they are not directly comparable because of differing definitions and universes. The item nonresponse rates are calculated before preediting or characteristic imputation and do not take into consideration the validity of a response. In other words, item nonresponse simply measures respondent cooperation. There is one exception, however: addresses enumerated by administrative records, because the data are derived from administrative records and not a respondent. Item nonresponse rates and imputation rates are calculated for addresses enumerated by administrative records in the same way as records where the respondent provided data, but the logic used to create these rates may not fully apply to administrative records because of the unique nature of those enumerations.

Imputation is a statistical technique used to fill in missing information, and imputation rates considered missing, inconsistent, or unusable responses. Below are three types of characteristic imputation used during a census.

**Assignment** — a response is either missing or not consistent with other responses and an item value *can* be determined based on other information provided for that same person or household. For example, if race is missing but a Hispanic origin write-in identifies a race, then race can be assigned from the Hispanic origin response.

**Allocation** — a response is either missing or not consistent with other responses and an item value *cannot* be determined based on information provided for that same person. An allocation will be assigned to the individual from another person within the housing unit (HU) or group quarters (GQ) or from a person in a nearby HU/GQ. The allocation rates for totally allocated persons will be defined and reported in a later section.

**Substitution** — when characteristics for every person in the HU are missing. A nearby HU with complete person data is selected to represent the person-level items for the first six persons in the HU needing substitution or administrative records are used for allocation. When the population of the HU needing substitution is greater than six, all characteristic data for the remaining persons are allocated. All persons in substituted HUs are considered substituted persons for this assessment.

For 2020, this assessment reports responses by self-response modes, enumerator operations, and Group Quarters operations. For housing unit addresses in the Type of Enumeration Area (TEA) 1 (Self-Response) and TEA 6 (Update Leave), tabulation of INR and imputation rates falls under the self-response category. Within the self-response category, ID and non-ID results are shown for the internet and phone modes, along with English and Bilingual for the paper modes. The Bilingual category refers to the addresses that received the bilingual mailing materials. The selection of these addresses was based on American Community Survey (ACS) data that identified census tracts that had 20 percent or more occupied households where at least one person is age 15 or older, speaks Spanish, and does not speak English “very well.” For housing unit addresses that did not self-respond and therefore responded by an enumerator or were enumerated by administrative records, INR and imputation rates are tabulated under the enumerator modes/operations category. Group quarters (GQs) also have their own section for INR and imputation rates. There were some people who responded at a GQ, but after processing, they were placed in a housing unit. These people are referred to as “GQ Persons on the HU Persons File.” It is important for us to distinguish this group because the GQ questionnaire did not have the same questions as the HU questionnaire (e.g., there was no relationship question).

The breakdown of modes and operations in this report is as follows:

- Self-Response Modes for TEA 1 and 6 Housing Units:
  - Internet
  - Phone
  - Paper
- Enumerator Modes/Operations:
  - Nonresponse Followup (NRFU) Production, NRFU Reinterview (RI)<sup>1</sup>
  - Update Enumerate (UE)
  - Coverage Improvement (Cov. Imp.)
  - Remote Alaska (RA)
  - Enumeration of Transitory Locations (ETL)
  - Administrative Records (AR) Enumerations
- Group Quarters Enumeration (GQ)
- GQ Persons on the HU Persons File

## 2.2 Previous Research and Literature Review

The 2010 Census Item Nonresponse and Imputation Assessment (Rothhaas, 2012) included tenure, relationship, sex, age/date of birth, Hispanic origin, and race questionnaire item missingness by mode/operation. Among person-level items, Hispanic origin (3.9 percent) had the highest item nonresponse rate and age/date of birth (5.1 percent) had the highest imputation rate. For tenure, the only household-level item, the item nonresponse rate was 4.5 percent and the imputation rate was 3.5 percent.

Based on results from the 2010 report, the following Knowledge Management recommendations were made:

- As a result of high item nonresponse for Hispanic origin (3.9 percent) and race (3.3 percent) items, the recommendation was made to identify methods to decrease the item nonresponse for these items.
- When race and Hispanic origin were left blank or inconsistent with other responses and a value could not be determined, an assigned value was provided from the 2000 Census and the American Community Survey (ACS). This accounted for 36.6 percent of imputed Hispanic origin and 28.6 percent of imputed race responses. The recommendation was made to continue allocation using these sources, as well as administrative records, and complete a quality check of the previous response data. The recommendation was also made to assess how administrative records may assist with race and Hispanic origin determination.
- Approximately 5.7 million people (1.9 percent) were acquired through “whole-house” substitution, where all characteristics for every person in the housing unit (HU) were missing. The recommendation was made to investigate the operational source of substitutions,

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<sup>1</sup> NRFU Reinterview (RI) includes cases that were part of a quality check conducted by the Census Bureau during the 2020 Census.

including operations producing cases needing substitutions and operations contributing data for substitution.

In the 2010 Census, the primary mode for self-response was the paper questionnaires mailed to addresses. If a household did not respond, census enumerators conducted in-person follow-ups. The 2010 INR and imputation rates include these modes. For the 2020 Census, the Census Bureau mailed paper questionnaires to households again, but the primary mode for self-response was the internet. Responding by phone was also a mode of self-response offered to respondents for the 2020 Census through the Census Questionnaire Assistance (CQA) operation. Therefore, the 2020 assessment will include missing responses from the internet instrument, paper, and phone. Recommendations from the 2010 Census Knowledge Management were incorporated into the design of the 2020 modes and operations.

Another difference between the 2010 and 2020 censuses is the use of administrative records for enumeration and characteristic imputation. For those units where the Census Bureau had high-quality administrative records in 2020, an attempt was made to get a self-response or an enumerated response in NRFU. If a response was not received, the unit was removed from the NRFU workload and the address was enumerated with the administrative records data. Additionally, administrative records were used to impute characteristic items where data were missing. This recommendation was derived from the 2010 INR and Imputation assessment.

Upon completion of the 2010 Census, a 2010 Census Quality Survey (CQS) was conducted to evaluate the paper questionnaire and internet option (Bentley et al., 2011). The content was like that of the 2010 Census questionnaire. However, three contact strategies were used: Internet Push, Internet/Mail Choice, and Mail only. Results from the CQS indicated that the Internet Push option had the lowest participation (46.5 percent), followed by Internet Mail/Choice (55.1 percent). Mail only had the highest participation (56.0 percent). Yet, item nonresponse rate analysis showed soft edits, where respondents receive a warning when an item is skipped, in the internet instrument contributed to lower rates of missing data from the Internet Push group.

In 2012, the National Census Test (NCT) further assessed the Internet Push method (Bentley, 2014). The 2012 NCT observed self-response rates and item nonresponse across several contact strategies under the Internet Push methodology, which encouraged respondents to submit online. Additionally, the 2012 NCT evaluated two versions of a combined Hispanic origin and race question. Results showed no statistical significance for item nonresponse rates across contact strategies and the rate was less than 3 percent for all census data items. There was lower item nonresponse for the two-part Hispanic origin and race question than one-part question.

The 2014 Census Test observed methods to follow up with nonresponding addresses and strategies encouraging self-response (Bentley, 2016). The test included eight self-response contact strategies from the following groups: 1) Notify Me Census (Preregistration), 2) Internet Push without an ID, 3) E-

mail invitations and reminders, and 4) Automated voice invitations. The 2014 Census Test also included an experiment of three variations on the race and Hispanic origin questions and two variations of the relationship question. Results for race and Hispanic origin question showed the combined version on separate screens had significantly lower item nonresponse than those on the same screen or listing them as separate questions. Results for the paper version of the new relationship question showed slightly higher item nonresponse.

The 2015 National Content Test (NCT) compared alternative versions of the race and ethnicity questions to improve question design and quality for the 2020 Census (Mathews et al., 2017). Key test observations included question format, response categories, instruction wording, and question terminology. Results for the combined question format showed significantly lower percentages of missing and invalid responses when compared to the separate question format. Additionally, respondents who identified as Hispanic responded to the combined questions format at a higher rate than the separate questions format.

### 3. Methodology

All 2020 Census Operational Assessments share a similar methodology. In general, they provide details about the implementation of individual operations and processes (including final volumes, rates, and costs) by presenting data from production systems, files, and activity reports, in addition to information collected from lessons learned and debriefings sessions. These important measures are key ingredients to defining successful completion of the 2020 Census operations and processes. Typical categories of success measures are as follows:

- **Process Measures** that indicate how well the process works, typically including measures related to completion dates, rates, and productivity rates.
- **Cost Measures** that drive the cost of the operation and comparisons of actual costs to planned budgets. Costs can include workload as well as different types of resource costs.
- **Quality Measures** of operational results, typically including things such as rework rates, error rates, and coverage rates.

In addition to planning and managing the implementation of its operation, each Integrated Project Team (IPT) had the responsibility of determining the assessment questions for its operation. In consultation with the Decennial Research Objectives and Methods (DROM) Working Group, each IPT developed assessment questions tailored to the uniqueness of its operation that would yield the most useful information to those planning similar operations in the future. Assessment questions provide the framework for the Results section appearing in each operational assessment report.

The sections that follow present the assessment questions for this operation and describe the sources of information used to answer them.

### **3.1 Assessment Questions**

To measure success of respondent cooperation and response validity in the 2020 Census, the following questions regarding item nonresponse, imputation, previous census comparisons, and operational implementation are asked. The first set observes item nonresponse, the proportion of missing responses. The second set of questions addresses imputation, including inconsistent and unusable responses where values are either assigned or allocated. Then, there is a question about the comparison between the 2020 and the 2010 rates.

#### **A. Item Nonresponse**

1. What are the item nonresponse rates for the following household-level items: population count, undercount, telephone number, tenure, and population count only?
2. What are the item nonresponse rates for the following person-level items: relationship, sex, age/date of birth, Hispanic origin, race, and overcount?

#### **B. Imputation**

1. What are the imputation rates for tenure, sex, age/date of birth, Hispanic origin, race, and relationship?
2. What percent of imputed records used administrative records by item?
3. What are the percent of totally allocated persons?
4. What are the number and percent of person substitutions?
5. What are the percentages of persons with zero to five nonimputed responses to the person-level imputation data items?

#### **C. 2010 and 2020 Comparisons**

1. How do the 2020 item nonresponse and imputation rates compare to 2010 rates?

### **3.2 Data Sources and Calculations: Production Systems/Reports**

The analysts primarily used the Decennial Statistical Studies Division on-premises server, app2, to do the INR and imputation analysis. Analysts also used the Census Data Lake and Excel for a small portion of the INR and imputation analysis. The formulas used are referenced in the report below. Data manipulation steps involved merging Census Unedited File (CUF) or Census Edited File (CEF) universe datasets with the appropriate household-level and person-level datasets. The data were then subsetted to the relevant records, INR and imputation metrics were created, and records were

aggregated by mode or operation. Results for the INR rates are derived from the CUF and results for the imputation rates are derived from the CEF.

The CUF and CEF contain:

- HU- and GQ-level information (including address and operation information) for all unique HUs (including vacant HUs) and GQs.
- Return data for all housing unit returns that were selected by the Primary Selection Algorithm (PSA) and do not have a delete HU status.
- Person data for valid persons in PSA-selected HUs (which do not have a delete housing unit status).

Much of the data in the CUF and the CEF are the same, but the CEF also includes edited and imputed data.

Please note that the numbers appearing in this operational assessment report have been subjected to the U.S. Census Bureau's approved disclosure avoidance techniques including noise injection and rounding.

#### **4. Limitations**

This report documents the INR rates and imputation rates for the 2020 Census and 2010 Census. The following limitations to any comparison include:

1. The 2010 Census did not include an internet option for self-response or use administrative records for enumeration and characteristic imputation. The difference in response modes between the 2020 Census and the 2010 Census may result in different responding populations.
2. The 2010 Census results excluded experimental households, while the 2020 Census results included experimental households. Some of the questionnaire content for experimental housing units in the 2010 Census differed from the content for 2010 Census production housing units. For the 2020 Census, there were no differences in content between experimental housing units and production housing units, which made including them in the 2020 Census item nonresponse and imputation rates more feasible than was possible for the corresponding rates from the 2010 Census.
3. The 2020 Census design and content are not the same as the 2010 Census design and content. The 2020 Census has undergone changes to question wording, format, response categories, instructions, and other design features.
4. A confounding factor is the ten-year difference between the 2020 Census and the 2010 Census. This will likely result in real change to the survey environment and thus respondent compliance.



5. The COVID-19 pandemic was a major challenge never faced during a decennial census. Operational changes because of the pandemic included delayed field operations, an expanded data collection period, and considerable impacts for college populations and GQ enumerations. The impacts the pandemic might have had on the 2020 Census results cannot be fully explained or quantified.

## 5. Results

Rates for item nonresponse and imputation will exclude vacant, substituted housing units (HUs), and substituted group quarters (GQs). The rates are based on the primary return<sup>2</sup> record and its mode. Data were limited to Data Defined Persons (DDP) only, with the exception of analysis for totally allocated persons, substituted persons, and the population count only metric. Data Defined Persons are person-level records with minimal information, indicating an attempt to respond to the survey.

The universe for each cell in the tables below was carefully considered because some people were not asked all questions. For example, Persons 7 through 10 on the self-response questionnaire were not asked the race and ethnicity questions. Therefore, they were removed from the universe for those cells. These exceptions are documented in notes below each table. Puerto Rico is not included in the tables below. However, Puerto Rico will be included in the state tables in Appendix A.

In 2021, the Census Bureau provided information on the 2020 Census by releasing operational quality metrics. One set of the data quality metrics was Release 3 Table 2, which provided item nonresponse rates for population count, age or date of birth, race, and Hispanic origin, and the population count only metric. Some results in this assessment are the same as those from Release 3 for comparable table categories. However, there are some notable differences between the two sets of results. First, there are differences in how the population count only metric is defined. We improved the definition of the population count only metric in this assessment by expanding the universe. Also, the overall self-response rates for population count are calculated differently because we did not include internet and phone in the denominator for the state-level tables in this assessment. Other discrepancies are attributed to differences in table category groups. For example, the Release 3 table grouped the smaller enumerator return operations into one “Other” category, while this assessment shows the results of the smaller operations individually.

### 5.1 Item Nonresponse

1. What are the item nonresponse rates for the following household-level items: population count, undercount, tenure, telephone number, and population count only?

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<sup>2</sup> When more than one return is received from a HU, a primary return is selected.

**Population Count Only** — the respondent provides the household population count but does not provide responses for the household-level items (tenure and undercount) nor the person-level items for any person on the roster (sex, age/date of birth, Hispanic origin, race, relationship, and overcount). Population count only is a quality metric that measures which housing units provided minimal data.

INR measures the number of missing items from a universe. Missing items are responses not reported by the respondent, regardless of response validity. The formula below calculates item nonresponse rates.

$$\frac{\text{number of missing item responses in universe}}{\text{total records in universe}} \times 100 \text{ percent}$$

Table A displays INR rates for household-level items by type of self-response or enumerator return.

**Table A. 2020 Census Item Nonresponse Rates for Self-Response and Enumerator Return: Household-Level Items – National**

Mode/Operation	Population Count*	Undercount	Tenure	Telephone Number	Population Count Only*****
<b>Overall Self-Response (TEA 1 and 6)</b>					
Internet	n/a	0.8%	0.6%	0.2%	0.5%
ID	n/a	0.5%	0.4%	0.2%	0.3%
Non-ID	n/a	2.7%	2.4%	0.3%	2.3%
Phone	n/a	0.6%	1.1%	2.0%	0.3%
ID	n/a	0.5%	1.0%	2.0%	0.3%
Non-ID	n/a	0.8%	1.5%	2.2%	0.5%
Paper	3.6%	7.2%	3.0%	7.0%	0.1%
English	3.5%	6.9%	2.9%	7.0%	0.1%
Bilingual	8.4%	19.6%	6.7%	5.5%	<0.1%
<b>Self-Response (TEA 1)</b>					
Internet	n/a	0.8%	0.6%	0.2%	0.5%
ID	n/a	0.5%	0.3%	0.2%	0.3%
Non-ID	n/a	2.8%	2.5%	0.3%	2.3%
Phone	n/a	0.5%	1.1%	2.0%	0.3%
ID	n/a	0.5%	1.0%	2.0%	0.3%
Non-ID	n/a	0.8%	1.5%	2.2%	0.5%

Mode/Operation	Population Count*	Undercount	Tenure	Telephone Number	Population Count Only*****
Paper	3.6%	7.2%	3.0%	7.0%	0.1%
English	3.5%	6.9%	2.9%	7.1%	0.1%
Bilingual	8.4%	19.6%	6.7%	5.5%	<0.1%
<b>Update Leave (TEA 6)</b>					
Internet	n/a	1.3%	1.2%	0.3%	1.1%
ID	n/a	1.0%	0.9%	0.2%	0.8%
Non-ID	n/a	1.8%	1.6%	0.3%	1.5%
Phone	n/a	0.8%	1.5%	1.9%	0.5%
ID	n/a	0.8%	1.6%	2.0%	0.6%
Non-ID	n/a	0.6%	1.2%	1.7%	0.3%
Paper	3.6%	6.5%	2.7%	6.3%	0.1%
English	3.5%	6.4%	2.6%	6.3%	0.1%
Bilingual	9.1%	19.3%	6.8%	5.2%	<0.1%
<b>Enumerator Return</b>					
NRFU & NRFU RI	<0.1%	7.1%	16.4%	56.9%	5.9%
UE	4.6%	8.9%	8.9%	13.4%	0.0%
Cov. Imp.	n/a	0.2%	0.7%	0.0%***	n/a
RA	2.1%	4.1%	20.1%	14.2%	0.2%
ETL	0.3%	n/a****	9.9%	35.6%	0.0%
AR Enumerations**	n/a	100.0%	72.5%	100.0%	3.9%

Source: U.S. Census Bureau, 2020 Census Unedited File.

\*The instruments for the self-response internet and phone modes require a population count by design. Administrative records enumerations addresses have a population count provided by definition. The population count question is not asked during the Coverage Improvement interviews.

\*\*Administrative records enumerations do not provide data on undercount and telephone number.

\*\*\*Telephone number is required for the Coverage Improvement operation.

\*\*\*\*Undercount is not asked on the ETL forms.

\*\*\*\*\*The Population Count Only column is a different universe than the other columns because we do not require the people in the households to be Data Defined Persons (DDP) in order to see the records that only have population count.

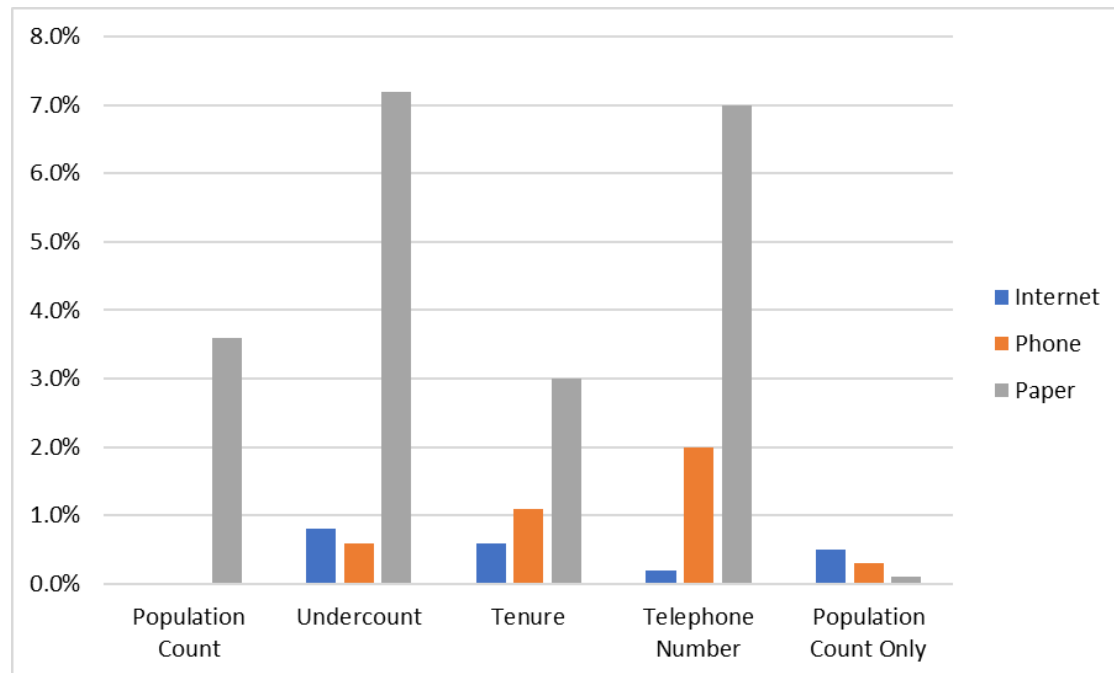
Within Overall Self-Response, internet had the lowest INR rates for the tenure and telephone number items, phone had the lowest rate for undercount, and paper had the lowest rate for population count only. The highest INR rates in the self-response modes are seen in the bilingual paper mode for the undercount item, with both the Self-Response and Update Leave TEAs having a value more than 19 percent. For Self-Response (TEA 1) and Update Leave (TEA 6) internet and phone modes, the non-ID INR rates are higher than ID INR rates for all household-level items, except for the Update Leave phone mode. Telephone number is the only item where bilingual paper INR rates are lower than English paper INR rates. The rates for the population count only metric were low for Self-Response and Update Leave, remaining under 1 percent across all modes, except for internet non-ID and Update Leave internet. This means that less than 1 percent of cases within these modes had respondents that

provided a household population count, but were missing the household-level items, along with all the person-level items for every person on the roster. Please note that Self-response (TEA 1) makes up the vast majority of addresses in the Overall Self-Response category (TEA 1 and 6). As a result, the Self-Response INR rates closely resemble the Overall Self-Response INR rates.

Coverage Improvement had the lowest INR rates among the enumerator returns. The highest INR rate for NRFU, the largest enumerator operation, was telephone number (56.9 percent).

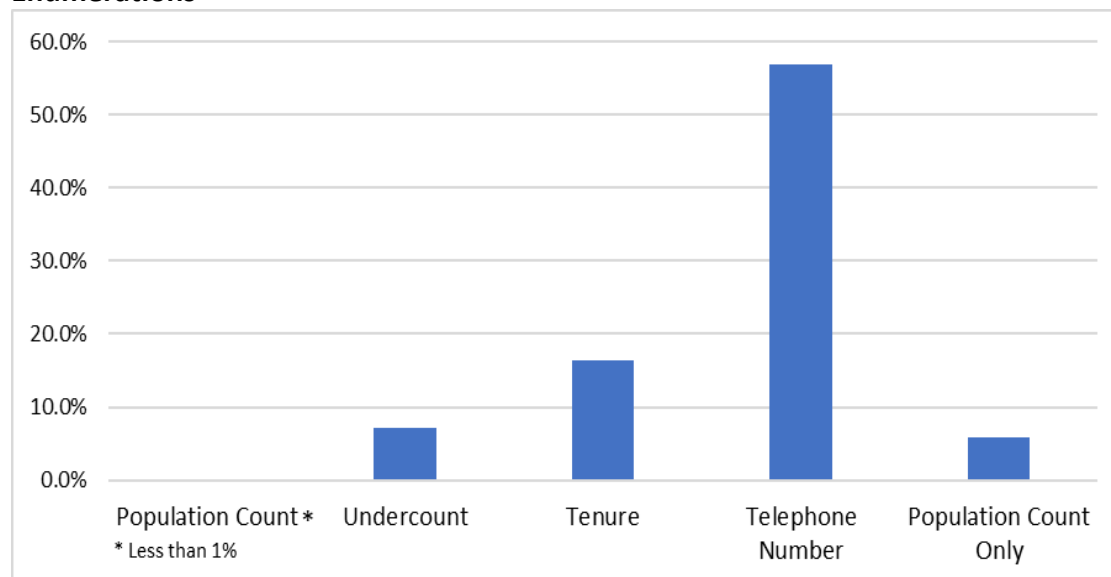
Figure 1 shows INR rates of household-level items by overall self-response mode. Figure 2 displays the INR rates of household-level items within NRFU and NRFU RI enumerator returns.

**Figure 1. 2020 Census Item Nonresponse Rates for Household-Level Items: Overall Self-Response Modes**



Source: U.S. Census Bureau, 2020 Census Unedited File.

**Figure 2. 2020 Census Item Nonresponse Rates for Household-Level Items: NRFU and NRFU RI Enumerations**



Source: U.S. Census Bureau, 2020 Census Unedited File.

- What are the item nonresponse rates for the following person-level items: sex, age/date of birth, Hispanic origin, race, overcount, and relationship?

Table B provides INR rates for person-level items by type of self-response or enumerator return.

**Table B. 2020 Census Item Nonresponse Rates for Self-Response and Enumerator Returns: Person-Level Items – National**

Mode/Operation	Sex	Age/Date of Birth*	Hispanic Origin **	Race **	Overcount ***	Relationship ****
<b>Overall Self-Response (TEA 1 and 6)</b>						
Internet	1.3%	1.4%	1.5%	2.2%	2.7%	2.4%
ID	0.8%	0.9%	1.0%	1.6%	2.3%	1.7%
Non-ID	4.4%	4.5%	4.7%	5.8%	5.0%	6.5%
Phone	1.0%	1.6%	2.0%	4.2%	4.2%	3.6%
ID	0.8%	1.4%	1.8%	4.0%	4.1%	3.5%
Non-ID	1.5%	2.2%	2.6%	5.1%	4.5%	4.1%
Paper	0.8%	0.8%	6.1%	4.7%	2.0%	2.8%
English	0.7%	0.8%	6.3%	3.9%	1.7%	2.8%
Bilingual	2.1%	0.7%	2.4%	23.9%	6.3%	1.9%

Mode/Operation	Sex	Age/Date of Birth*	Hispanic Origin **	Race **	Overcount ***	Relationship ****
<b>Self-Response (TEA 1)</b>						
Internet	1.3%	1.4%	1.5%	2.2%	2.7%	2.4%
ID	0.8%	0.9%	1.0%	1.6%	2.3%	1.7%
Non-ID	4.4%	4.5%	4.8%	5.9%	5.0%	6.6%
Phone	1.0%	1.6%	2.0%	4.3%	4.1%	3.6%
ID	0.8%	1.4%	1.8%	4.0%	4.0%	3.4%
Non-ID	1.5%	2.2%	2.6%	5.2%	4.5%	4.1%
Paper	0.8%	0.8%	6.1%	4.7%	2.0%	2.8%
English	0.7%	0.8%	6.3%	4.0%	1.7%	2.8%
Bilingual	2.1%	0.7%	2.4%	23.9%	6.3%	1.9%
<b>Update Leave (TEA 6)</b>						
Internet	1.9%	1.9%	2.1%	2.7%	3.8%	3.8%
ID	1.1%	1.1%	1.3%	1.8%	3.6%	2.9%
Non-ID	3.0%	3.0%	3.3%	4.1%	4.0%	4.9%
Phone	1.2%	1.6%	2.2%	3.2%	4.9%	4.9%
ID	1.2%	1.5%	2.1%	3.0%	5.1%	5.6%
Non-ID	1.2%	1.8%	2.3%	3.5%	4.4%	3.9%
Paper	0.7%	0.7%	5.4%	3.1%	1.7%	2.7%
English	0.7%	0.7%	5.5%	2.8%	1.6%	2.7%
Bilingual	2.0%	0.4%	2.4%	20.6%	5.8%	1.7%
<b>Enumerator Return</b>						
NRFU & NRFU RI	9.3%	28.4%	15.1%	17.9%	2.8%	12.5%
UE	2.2%	12.3%	7.1%	6.2%	5.7%	3.4%
Cov. Imp.	0.4%	0.6%	5.7%	5.6%	2.2%	3.0%
RA	1.6%	5.8%	4.2%	1.9%	3.6%	3.6%
ETL	3.7%	21.2%	19.4%	17.9%	13.5%	10.5%
AR Enumerations	3.5%	3.5%	28.3%	18.1%	20.8%	63.0%

Source: U.S. Census Bureau, 2020 Census Unedited File.

\* Age/date of birth is considered missing if neither age nor year of birth is provided.

\*\* Persons on the extended roster for self-response paper cases are excluded because the Hispanic origin and race questions are not asked.

\*\*\* Only records where the overcount question was asked are included in the table because the question is not always asked for everyone on the roster. For certain non-paper modes, a person's name on the roster must be selected by the respondent when asked if anyone on the roster sometimes lives or stays somewhere other than the reference address. For paper modes, person 1 is not asked the overcount question, except for ETL. The overcount question is not asked on the extended roster for self-response paper cases.

\*\*\*\* Person 1 on the roster is not asked the relationship question, so person 1 records are excluded from the table. A simplified version of the relationship question is asked on the extended roster for self-response paper cases.

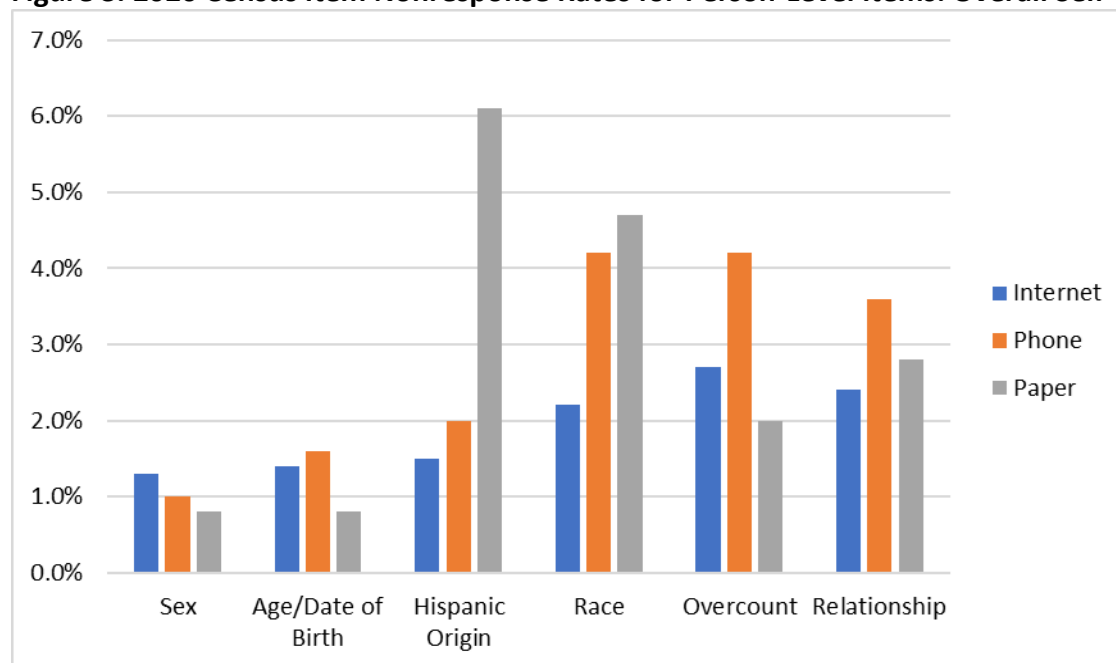
Within Overall Self-Response, internet had the lowest INR rates for the Hispanic origin, race, and relationship items, while paper had the lowest rates for sex, age/date of birth, and overcount. The highest INR rates among the self-response returns occurred in the bilingual paper mode for the race item, with both Self-Response and Update Leave having a value of greater than 20 percent. This is not surprising, because the bilingual materials are sent to areas with high rates of Hispanic populations. As we have seen in past census data collections those who identify as Hispanic leave the race question blank at higher rates than other populations. The paper mode is the only return type in this assessment where the bilingual and nonbilingual areas are distinguished, therefore this distinction was not examined for other modes.

Non-ID INR rates are higher than ID INR rates for all items in Self-Response (TEA 1) and Update Leave (TEA 6), except for Update Leave phone. For both Self-Response and Update Leave, English paper modes had higher INR rates than the bilingual paper modes for age/date of birth, Hispanic origin, and relationship.

The lowest INR rates among enumerator returns occurred in Coverage Improvement, with the highest INR rate being 5.7 percent for the Hispanic origin question. The highest INR rate for NRFU person-level data was for age/date of birth (28.4 percent).

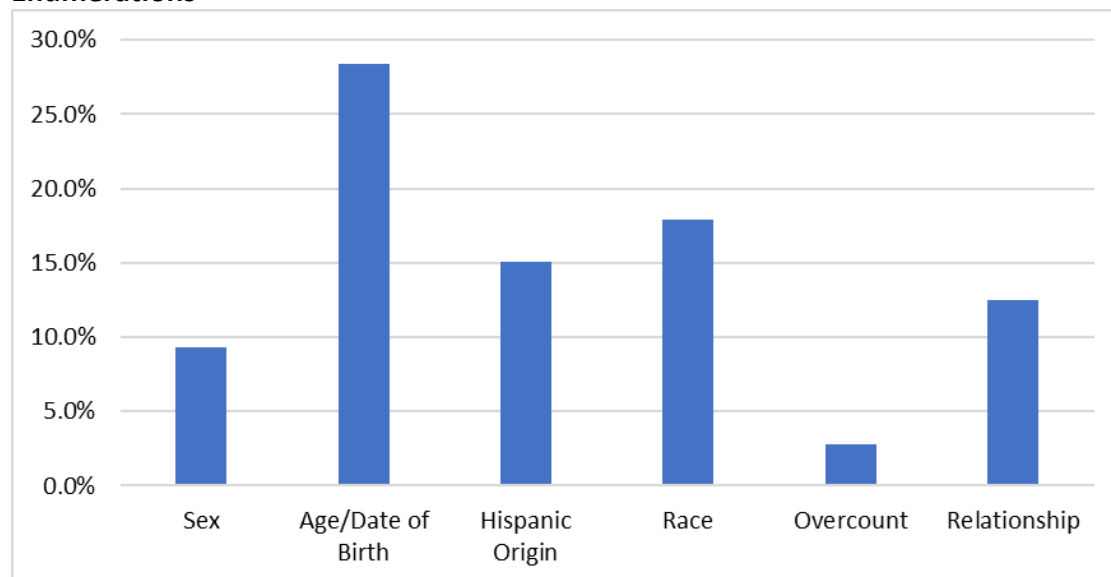
Figure 3 presents the INR rates of person-level items by overall self-response mode. Figure 4 shows the INR rates of person-level items within the NRFU and NRFU RI enumerator return category.

**Figure 3. 2020 Census Item Nonresponse Rates for Person-Level Items: Overall Self-Response Modes**



Source: U.S. Census Bureau, 2020 Census Unedited File.

**Figure 4. 2020 Census Item Nonresponse Rates for Person-Level Items: NRFU and NRFU RI Enumerations**



Source: U.S. Census Bureau, 2020 Census Unedited File.

Table C and Figure 5 display INR rates for person-level items for GQs.

**Table C. 2020 Census Item Nonresponse Rates for GQ Person-Level Items by GQ Type – National**

GQ Type	Person Item Nonresponse			
	Sex	Age/Date of Birth	Hispanic Origin	Race
<b>GQs</b>	22.0%	17.8%	43.9%	30.2%
<b>Institutional GQs</b>	4.7%	4.8%	27.1%	8.7%
Correctional Facilities for Adults	3.2%	3.4%	25.9%	5.0%
Juvenile Facilities	4.8%	5.8%	22.8%	10.8%
Nursing Facilities	6.4%	6.2%	28.7%	12.9%
Other Institutional Facilities	9.9%	9.4%	34.0%	16.1%
<b>Noninstitutional GQs</b>	36.7%	28.9%	58.0%	48.4%
College/University Housing	43.9%	27.2%	62.4%	54.3%
Military Quarters	25.6%	40.5%	76.6%	62.8%
Other Noninstitutional Facilities	24.9%	29.4%	45.3%	33.5%
<b>GQ Persons on the HU Persons File</b>	4.4%	3.4%	51.8%	7.0%

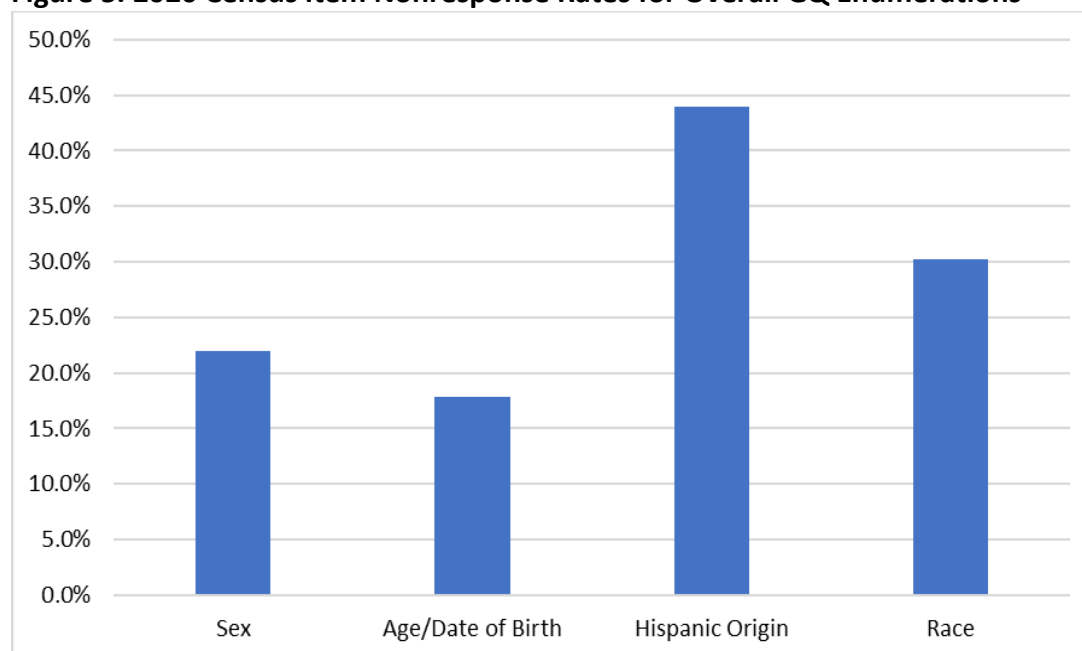
Source: U.S. Census Bureau, 2020 Census Unedited File.



GQ enumerations had relatively high INR rates. For GQs overall, all items had rates greater than 17.8 percent, with Hispanic origin having the highest INR rate at 43.9 percent. Hispanic origin INR rates were greater than 22 percent across all GQ types. Institutional GQs have lower INR rates than noninstitutional GQs for all person-level items. The lowest INR rate was 3.2 percent for the sex question for Correctional Facilities for Adults and the highest INR rate was 76.6 percent for the Hispanic origin question at military quarters.

The GQ Persons on the HU Persons File occurs when a person’s data are given on a GQ form, but after processing is counted in a HU. These cases have relatively low INR rates, except for Hispanic origin.

**Figure 5. 2020 Census Item Nonresponse Rates for Overall GQ Enumerations**



Source: U.S. Census Bureau, 2020 Census Unedited File.

## 5.2 Imputation

1. What are the imputation rates for tenure, relationship, sex, age/date of birth, Hispanic origin, and race?

There are two types of imputation rates: assignment and allocation. Nonimputed responses are valid responses that the respondent reported. Please refer to the “2020 Census Edit and Characteristic Imputation Specification” for more details, including the edit and allocation flags that will be used to identify each imputation type. Substituted and totally allocated persons are not included in the tables for this research question. Rates and counts of those imputation types are provided in Research Questions 3 and 4.

**Assignment** — a response is either missing or not consistent with other responses and an item value *can* be determined based on other information provided for that same person or household. For example, if race is missing but a Hispanic origin write-in identifies a race, then race can be assigned from the Hispanic origin response. The formula for assignment rates is as follows:

$$\frac{\text{assignments}}{(\text{nonimputed responses}) + (\text{assignments}) + (\text{allocations})} \times 100 \text{ percent}$$

**Allocation** — a response is either missing or not consistent with other responses and an item value *cannot* be determined based on information provided for that same person. An allocation will be assigned to the individual from another person within the HU/GQ or from a person in a nearby HU/GQ. The allocation rates for totally allocated persons will be defined and reported in a later section.

The formula for allocation rates is as follows:

$$\frac{\text{allocations}}{(\text{nonimputed responses}) + (\text{assignments}) + (\text{allocations})} \times 100 \text{ percent}$$

**Nonimputed** — occupied HUs and persons within those units where items are not imputed and the values are valid. In 2010, nonimputed rates were referred to as “as reported” records rates. The INR rates in the previous section do not consider response validity so the INR and nonimputed rates are not directly comparable.

The formula for nonimputed rates is as follows:

$$\frac{\text{nonimputed responses}}{(\text{nonimputed responses}) + (\text{assignments}) + (\text{allocations})} \times 100 \text{ percent}$$

Table D presents the imputation rates for self-response returns.

**Table D. 2020 Census Nonimputed and Imputed Rates for Self-Response – National**

Mode/Operation	Tenure	Sex	Age/Date of Birth	Hispanic Origin	Race	Relationship
<b>Overall Self-Response (TEA 1 and 6)</b>						
Internet						
Nonimputed	99.4%	98.7%	96.7%	98.4%	97.6%	97.3%
Assigned	0.2%	1.3%	2.3%	0.6%	1.3%	0.6%
Allocated	0.5%	0.1%	1.0%	1.0%	1.1%	2.1%
Phone						
Nonimputed	98.9%	99.0%	94.2%	98.0%	95.6%	96.3%
Assigned	0.3%	0.9%	4.5%	1.0%	3.3%	0.7%
Allocated	0.9%	0.1%	1.3%	1.0%	1.1%	3.0%
Paper						
Nonimputed	96.4%	99.1%	95.1%	93.6%	95.0%	92.5%
Assigned	0.8%	0.7%	4.1%	6.1%	4.6%	2.5%
Allocated	2.8%	0.2%	0.8%	0.2%	0.4%	5.0%
<b>Self-Response (TEA 1)</b>						
Internet						
Nonimputed	99.4%	98.7%	96.7%	98.4%	97.6%	97.3%
Assigned	0.2%	1.3%	2.3%	0.6%	1.3%	0.6%
Allocated	0.4%	0.1%	1.0%	1.0%	1.1%	2.1%
Phone						
Nonimputed	98.9%	99.0%	94.2%	98.0%	95.6%	96.3%
Assigned	0.3%	0.9%	4.5%	1.0%	3.3%	0.7%
Allocated	0.8%	0.1%	1.3%	1.0%	1.1%	3.0%
Paper						
Nonimputed	96.4%	99.1%	95.0%	93.6%	94.9%	92.4%
Assigned	0.8%	0.8%	4.1%	6.1%	4.6%	2.5%
Allocated	2.8%	0.2%	0.8%	0.2%	0.4%	5.1%
<b>Update Leave (TEA 6)</b>						
Internet						
Nonimputed	98.8%	98.1%	96.2%	97.8%	97.1%	96.0%
Assigned	<0.1%	1.8%	2.2%	0.6%	1.2%	0.9%
Allocated	1.1%	0.1%	1.6%	1.6%	1.7%	3.1%
Phone						
Nonimputed	98.5%	98.8%	95.2%	97.8%	96.6%	95.3%
Assigned	<0.1%	1.1%	3.3%	1.0%	2.0%	0.9%
Allocated	1.4%	<0.1%	1.5%	1.3%	1.4%	3.8%

Mode/Operation	Tenure	Sex	Age/Date of Birth	Hispanic Origin	Race	Relationship
Paper						
Nonimputed	96.7%	99.2%	95.5%	94.4%	96.6%	92.9%
Assigned	0.1%	0.6%	3.7%	5.4%	3.0%	2.3%
Allocated	3.2%	0.2%	0.8%	0.3%	0.4%	4.8%

Source: U.S. Census Bureau, 2020 Census Edited File.

The overwhelming majority of responses, more than 92 percent, are nonimputed for all items. Within Overall Self-Response modes, internet had the lowest imputation rates for all items except for sex. Moreover, the tenure item has the lowest imputation rate for internet, while the sex item had the lowest imputation rates in the phone and paper modes. Imputation occurred most frequently for the relationship item's Self-Response (TEA 1) paper responses with a nonimputed rate of 92.4 percent. For Overall Self-Response and Self-Response (TEA 1), tenure and relationship were allocated more often than assigned for the missing or invalid responses. Whereas sex, age/date of birth, and race were assigned more often than allocated for the missing or invalid responses.

Table E shows the imputation rates for enumerator returns.

**Table E. 2020 Census Nonimputed and Imputed Rates for Enumerator Return – National**

Mode	Tenure	Sex	Age/Date of Birth*	Hispanic Origin	Race	Relationship
<b>Enumerator Return</b>						
Nonimputed	70.1%	78.1%	47.5%	73.2%	71.0%	76.0%
Assigned	7.5%	20.9%	29.9%	13.9%	15.2%	6.4%
Allocated	22.4%	1.1%	22.6%	12.9%	13.8%	17.6%
<b>NRFU &amp; NRFU RI</b>						
Nonimputed	83.6%	90.7%	51.4%	84.9%	82.1%	85.9%
Assigned	3.5%	8.6%	20.1%	1.6%	3.4%	1.8%
Allocated	12.9%	0.7%	28.5%	13.5%	14.5%	12.3%
<b>UE</b>						
Nonimputed	91.1%	97.7%	70.5%	92.9%	93.8%	93.8%
Assigned	0.0%	1.7%	17.0%	3.1%	1.5%	2.8%
Allocated	8.9%	0.6%	12.5%	4.0%	4.8%	3.4%
<b>Cov. Imp.</b>						
Nonimputed	98.4%	99.5%	96.2%	94.1%	94.2%	93.3%
Assigned	0.4%	0.5%	3.1%	4.4%	4.2%	2.5%
Allocated	1.2%	<0.1%	0.7%	1.5%	1.6%	4.2%
<b>RA</b>						
Nonimputed	79.7%	98.2%	84.4%	95.8%	98.1%	94.5%
Assigned	0.0%	1.4%	9.7%	3.0%	0.4%	1.4%

Mode	Tenure	Sex	Age/Date of Birth*	Hispanic Origin	Race	Relationship
Allocated	20.3%	0.4%	6.0%	1.2%	1.6%	4.1%
ETL						
Nonimputed	89.9%	96.3%	66.0%	80.4%	81.8%	84.9%
Assigned	0.0%	3.5%	12.6%	6.6%	4.8%	5.3%
Allocated	10.1%	0.3%	21.4%	13.0%	13.4%	9.9%
AR Enumerations						
Nonimputed**	0.0%	0.0%	0.1%	<0.1%	<0.1%	3.5%
Assigned	27.9%	96.6%	96.4%	83.6%	83.5%	37.5%
Allocated	72.1%	3.4%	3.5%	16.4%	16.5%	59.0%

Source: U.S. Census Bureau, 2020 Census Edited File.

\* The age/date of birth item requires both the age and date of birth pieces of information to be considered nonimputed.

\*\*The logic used to create these rates may not fully apply to administrative records because of the unique nature of those enumerations. Specifically for the relationship question, this rate is likely artificially high because of difficulties in identifying the householder, who does not answer the relationship question.

Most responses are nonimputed for all modes except for AR enumerations. Coverage Improvement had the lowest imputation rates for the tenure, sex, and age/date of birth items, while Rural Alaska had the lowest imputation rates for the Hispanic origin, race, and relationship items. For NRFU, the sex item had the lowest imputation rate, with a value of 9.3 percent. Age/date of birth had the highest imputation rates for every enumerator mode except Coverage Improvement, Rural Alaska, and AR enumerations. For the enumerator returns, responses for sex, age/date of birth, Hispanic origin, and race were assigned more often than allocated. Tenure and relationship had allocated responses more often than assigned.

It should be noted that the implication of having high imputation rates is different for AR enumerations than the other types of returns because AR enumerations are not respondent-based and are fully imputed by definition. AR enumeration cases are used if no other response was received and high-quality administrative records data are available for an address. For AR enumerations, characteristics are imputed from past censuses, the American Community Survey (ACS), and other high-quality administrative records data. Characteristics without administrative records data were allocated using the hot deck procedure. Table E distinguishes whether the imputation for AR enumerations was assigned or allocated.

Table F displays the imputation rates for person-level items by GQ type.

**Table F. 2020 Census Nonimputed and Imputed Rates for Group Quarters – National**

Mode/Operation	Sex	Age/Date of Birth	Hispanic Origin	Race
<b>GQ Overall</b>				
Nonimputed	78.0%	69.7%	53.8%	67.1%
Assigned	15.9%	12.0%	24.9%	11.1%
Allocated	6.1%	18.3%	21.3%	21.7%
<b>Institutional GQs</b>				
Nonimputed	95.3%	88.1%	71.2%	89.9%
Assigned	2.7%	6.8%	23.6%	4.7%
Allocated	2.0%	5.1%	5.2%	5.4%
Correctional Facilities for Adults				
Nonimputed	96.8%	90.6%	71.7%	93.5%
Assigned	1.7%	5.9%	24.5%	2.6%
Allocated	1.5%	3.6%	3.8%	3.9%
Juvenile Facilities				
Nonimputed	95.2%	81.9%	76.4%	86.3%
Assigned	2.0%	9.7%	16.4%	5.8%
Allocated	2.8%	8.4%	7.2%	8.0%
Nursing Facilities				
Nonimputed	93.6%	86.0%	70.5%	86.0%
Assigned	3.9%	7.6%	22.8%	7.2%
Allocated	2.5%	6.4%	6.7%	6.8%
Other Institutional Facilities				
Nonimputed	90.1%	73.3%	64.6%	81.0%
Assigned	3.9%	10.8%	23.1%	6.4%
Allocated	6.0%	15.9%	12.3%	12.6%
<b>Noninstitutional Facilities</b>				
Nonimputed	63.3%	54.1%	39.1%	47.8%
Assigned	27.1%	16.4%	26.0%	16.6%
Allocated	9.6%	29.5%	34.9%	35.6%
College/University Housing				
Nonimputed	56.0%	52.6%	33.9%	40.7%
Assigned	40.6%	20.0%	29.3%	21.6%
Allocated	3.4%	27.4%	36.9%	37.7%
Military Quarters				
Nonimputed	74.4%	48.2%	21.6%	35.4%

Mode/Operation	Sex	Age/Date of Birth	Hispanic Origin	Race
Assigned	8.6%	11.0%	33.9%	19.9%
Allocated	17.0%	40.8%	44.5%	44.7%
Other Noninstitutional Facilities				
Nonimputed	75.1%	58.6%	53.3%	64.7%
Assigned	4.8%	10.5%	17.8%	6.1%
Allocated	20.1%	30.9%	28.9%	29.2%
<b>GQ Persons on the HU Persons File</b>				
Nonimputed	95.6%	41.7%	47.6%	92.6%
Assigned	4.0%	54.6%	48.6%	3.5%
Allocated	0.4%	3.7%	3.8%	3.8%

Source: U.S. Census Bureau, 2020 Census Edited File.

Across all GQ types, sex had the lowest imputation rates and Hispanic origin had the highest imputation rates. For GQs overall, sex had the lowest imputation rate at 22.0 percent and Hispanic origin had the highest imputation rate at 46.2 percent. Institutional GQs had lower imputation rates than noninstitutional GQs. For GQs overall, sex and Hispanic origin had higher assignment rates than allocated rates, while age/date of birth and race had higher allocated rates.

## 2. What percent of imputed records used administrative records by item?

As part of response post-processing, high-quality data sources are used to provide information for missing responses. This helps make the census more complete. Administrative records are previously collected information from federal, state, and local government agencies, including data from previous censuses and ACS reports. Imputed administrative records are used for characteristic imputation and administrative records enumerations.

Table G provides the rates of administrative records usage for imputation by mode/operation. The numerator for these rates is imputed cases that used administrative records, while the denominator is all imputed records for a question.

**Table G. 2020 Census Use of Administrative Records for Imputation Rates – National**

Mode/Operation	Tenure	Sex	Age/Date of Birth	Hispanic Origin	Race	Relationship
<b>Overall Self-Response (TEA 1 and 6)</b>						
Internet	40.5%	28.4%	11.5%	36.2%	54.2%	4.5%
Phone	35.3%	23.8%	5.7%	42.1%	55.5%	1.3%
Paper	29.8%	63.1%	3.1%	69.1%	72.3%	9.1%

Mode/Operation	Tenure	Sex	Age/Date of Birth	Hispanic Origin	Race	Relationship
<b>Self-Response (TEA 1)</b>						
Internet	41.0%	28.6%	11.5%	36.4%	54.3%	4.5%
Phone	35.7%	24.1%	5.7%	42.3%	55.6%	1.4%
Paper	30.2%	63.3%	3.1%	69.2%	72.3%	9.1%
<b>Update Leave (TEA 6)</b>						
Internet	21.3%	18.6%	9.1%	26.6%	46.0%	2.8%
Phone	22.6%	13.7%	4.0%	35.2%	48.3%	0.7%
Paper	19.1%	57.6%	1.5%	65.7%	71.4%	8.7%
<b>Enumerator Return</b>						
NRFU & NRFU RI	37.5%	1.0%	0.5%	2.7%	5.3%	0.4%
UE	5.9%	29.1%	0.4%	17.2%	23.6%	4.0%
Cov. Imp.	31.1%	66.3%	2.0%	54.9%	59.1%	5.2%
RA	0.1%	40.0%	0.6%	33.1%	16.0%	8.4%
ETL	0.0%	44.6%	0.1%	14.5%	14.5%	1.4%
AR Enumerations	39.3%	96.5%	96.5%	81.8%	94.5%	38.5%
<b>GQ Persons on the HU Persons File</b>	n/a	23.7%	<0.1%	73.6%	41.7%	n/a

Source: U.S. Census Bureau, 2020 Census Edited File.

Within Overall Self-Response, paper had the highest rate of administrative records usage for all items, except for tenure and age/date of birth. Administrative records usage rates ranged from 1.3 percent for the relationship item for phone to 72.3 percent for the race item for paper.

For NRFU, the lowest administrative records usage rate was relationship at 0.4 percent, while the highest rate was tenure at 37.5 percent. As expected, administrative records enumerations had the high imputation rates using administrative records in the table, with the sex, age/date of birth, Hispanic origin, and race items having rates greater than 81.8 percent. Moreover, for all modes/operations in the table, administrative records enumerations had the highest administrative record usage rate for every item, except tenure.

### 3. What are the percent of totally allocated persons?

**Totally Allocated** — when every characteristic for a person requires editing, allocation, or assignment, yet at least one other person within the housing unit has some reported data.

Table H shows the percent of totally allocated persons by mode/operation. The analysis for Table H did not require persons to be Data Defined Persons (DDP) to include records that are totally allocated. If records were required to be DDP, then there would be no totally allocated records in this table. The Percent of All Responses column rates are calculated by row and the denominator is all cases (totally



allocated and not totally allocated). The Percent of Totally Allocated Cases column rates all have the same denominator, which is the number of totally allocated cases.

**Table H. Percent Totally Allocated Persons by Operation/Mode**

Mode/Operation	Percent of All Responses	Percent of Totally Allocated Cases
<b>Overall</b>	0.6%	100.0%
<b>Overall Self-Response (TEA 1 and 6)</b>		
Internet	0.7%	66.5%
Phone	0.5%	0.8%
Paper	0.2%	4.3%
<b>Self-Response (TEA 1)</b>		
Internet	0.7%	65.2%
Phone	0.5%	0.8%
Paper	0.2%	4.1%
<b>Update Leave (TEA 6)</b>		
Internet	1.0%	1.2%
Phone	0.5%	<0.1%
Paper	0.3%	0.2%
<b>Enumerator Return*</b>		
NRFU & NRFU RI	1.0%	28.4%
UE	0.0%	0.0%
Cov. Imp.	0.0%	0.0%
RA	0.0%	0.0%
ETL	0.0%	0.0%
AR Enumerations	0.0%	0.0%

Source: U.S. Census Bureau, 2020 Census Edited File.

\*AR enumerations cannot be totally allocated because they do not include count discrepant cases, which is the main reason a totally allocated record is created. A possible explanation for the zeroes for the smaller enumerator return operations is a lack of administrative records data that would show that the HU size is different than what was stated in the census response, resulting in count imputation.

Overall, totally allocated persons make up about 0.6 percent of all cases. Within self-response modes, paper had the lowest totally allocated rates, while internet had the highest rates. Among totally allocated persons, Update Leave phone had the fewest totally allocated cases, with a totally allocated rate less than 0.1 percent. Overall Self-Response internet had the most cases at 66.5 percent.

#### 4. What are the number and percent of person substitutions?

**Substitution** — when characteristics for every person in the HU are missing. A nearby HU with complete person data is selected to represent the person-level items for the first six persons in the

HU needing substitution or administrative records are used for allocation. When the population of the HU needing substitution is greater than six, all characteristic data for the remaining persons are allocated. All persons in substituted HUs are considered substituted persons for this assessment. The formula for substitution rates is as follows:

$$\frac{\text{substitutions}}{(\text{nonimputed responses}) + (\text{assignments}) + (\text{allocations}) + (\text{substitutions})} \times 100 \text{ percent}$$

Table I displays the number and percent of substituted persons. The analysis for Table I did not require the people to be Data Defined Persons (DDP) to capture substituted persons in the table; 2.2 percent of all persons were substituted.

**Table I. Number and Percent of Substituted Persons**

	Number	Percent of All Persons
Person Substitutions	6,954,000	2.2%

Source: U.S. Census Bureau, 2020 Census Edited File.

- What are the percentages of persons with zero to five nonimputed responses for the person-level imputation data items?

The data completeness statistic is a person-level summary of the total number of nonimputed responses to the data items. The distribution of this statistic indicates the level of valid responses by person. It ranges from zero to five since five person-level items are considered (age/date-of-birth, Hispanic origin, race, relationship, sex). This statistic will be broken out by mode and by person number.

Table J provides the percent of persons with nonimputed responses for five person-level items (relationship, sex, age/date of birth, Hispanic origin, race).

**Table J. Data Completeness Statistic**

	<b>5 of 5 Nonimputed Items</b>	<b>4 of 5 Nonimputed Items</b>	<b>3 of 5 Nonimputed Items</b>	<b>2 of 5 Nonimputed Items</b>	<b>1 of 5 Nonimputed Items</b>	<b>0 of 5 Nonimputed Items</b>
<b>Overall Self-Response (TEA 1 and 6)</b>						
Internet	94.9%	3.6%	0.2%	<0.1%	0.4%	0.9%
Phone	90.2%	7.8%	0.8%	0.3%	0.3%	0.6%
Paper	83.8%	13.4%	2.1%	0.5%	0.1%	<0.1%
<b>Self-Response (TEA 1)</b>						
Internet	94.9%	3.6%	0.2%	<0.1%	0.4%	0.9%
Phone	90.1%	7.8%	0.8%	0.3%	0.3%	0.6%
Paper	83.7%	13.5%	2.2%	0.5%	0.1%	<0.1%
<b>Update Leave (TEA 6)</b>						
Internet	94.1%	3.7%	0.3%	0.1%	0.7%	1.2%
Phone	91.8%	6.1%	0.6%	0.3%	0.5%	0.6%
Paper	86.2%	11.5%	1.7%	0.4%	0.1%	<0.1%
<b>Enumerator Return</b>						
NRFU & NRFU RI	49.1%	30.0%	5.8%	6.3%	4.9%	3.8%
UE	65.8%	25.5%	3.8%	4.2%	0.7%	0.0%
Cov. Imp.	86.0%	9.7%	2.2%	1.9%	0.2%	<0.1%
RA	79.8%	15.5%	2.8%	1.4%	0.4%	0.1%
ETL	57.0%	21.9%	6.6%	11.5%	2.8%	0.2%

Source: U.S. Census Bureau, 2020 Census Edited File.

Note: Persons on the self-response paper extended roster are excluded from this table because they are not asked all five items.

\*Person 1 on the roster is included despite not being asked the relationship question and is considered the “householder.” Therefore, person 1 will always have at least one nonimputed response.

Within Overall Self-Response, the rate of persons with five out of five nonimputed item responses was higher than 80 percent for all modes, with internet having the highest rate of 94.9 percent. Within enumerator returns, Coverage Improvement had the highest rate of nonimputed person-level responses (five out of five) with a value of 86 percent.

Table K displays the percent of persons with nonimputed responses for five person-level items by person number.

**Table K. Data Completeness Statistic – Percent of Persons in Housing Units by Sum of Nonimputed Responses to Person-Level Items**

Person Number	5 of 5 Nonimputed Items	4 of 5 Nonimputed Items	3 of 5 Nonimputed Items	2 of 5 Nonimputed Items	1 of 5 Nonimputed Items	0 of 5 Nonimputed Items
<b>Overall</b>	85.4%	9.5%	1.5%	1.2%	1.2%	1.2%
Person 1	87.5%	8.1%	1.1%	1.5%	1.8%	0.0%
Person 2	85.8%	9.4%	1.5%	1.0%	0.7%	1.6%
Person 3	83.4%	10.9%	1.8%	1.0%	0.7%	2.1%
Person 4	83.0%	11.1%	1.8%	1.0%	0.7%	2.4%
Person 5	80.6%	12.6%	2.1%	1.0%	0.7%	2.9%
Person 6	77.5%	14.6%	2.5%	1.2%	0.7%	3.5%

Source: U.S. Census Bureau, 2020 Census Edited File.

Note: Persons on the self-response paper extended roster are excluded from this table because they are not asked all five items.

\*Person 1 on the roster is included despite not being asked the relationship question and is considered the “householder.” Therefore, person 1 will always have at least one nonimputed response.

Most persons, 85.4 percent, had nonimputed responses for all items. Full person-level responses (five out of five) decreased for each additional person listed on the roster, with 87.5 percent for person 1 and 77.5 percent for person 6.

### 5.3 Comparisons Between the 2010 and 2020 Censuses

1. How do the 2020 item nonresponse and imputation rates compare to the 2010 Item Nonresponse and Imputation Assessment Report rates?

Table L compares 2010 and 2020 household-level item nonresponse rates. Figures 6 and 7 compare self-response rates and enumerator return rates, respectively.

**Table L. 2010 and 2020 Item Nonresponse Rate Comparison of Household-Level Items**

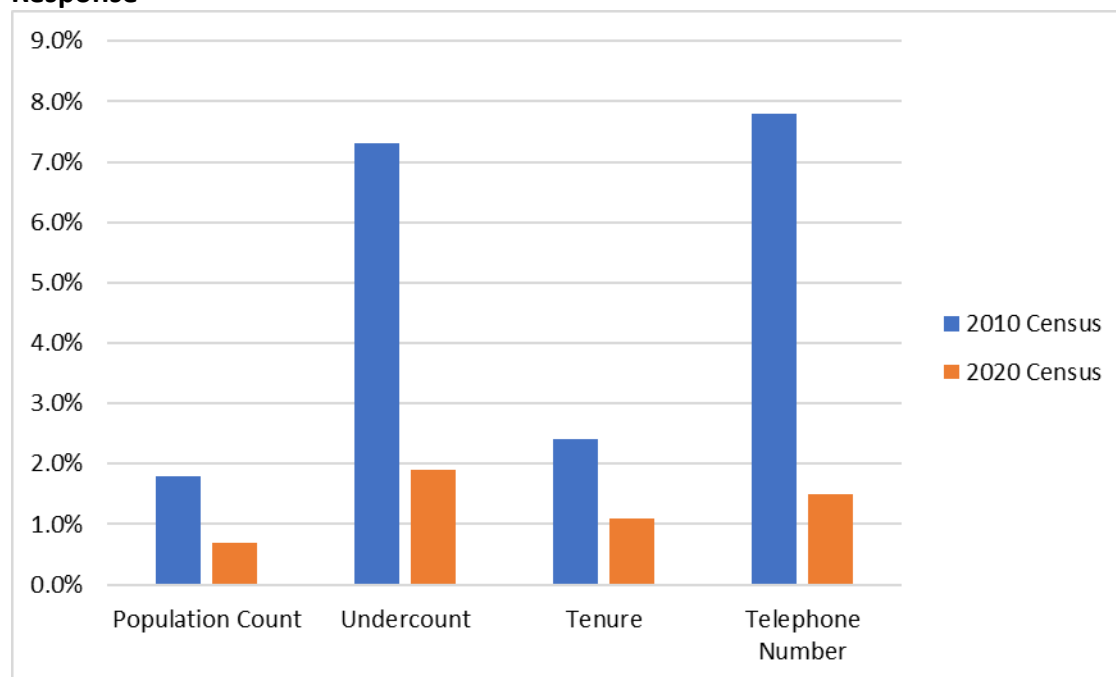
	Population Count	Undercount	Tenure	Telephone Number
<b>2010 Census Overall</b>	1.3%	8.5%	4.5%	8.3%
Self-Response	1.8%	7.3%	2.4%	7.8%
Enumerator Return	<0.1%	12.2%	9.7%	9.7%

	Population Count	Undercount	Tenure	Telephone Number
<b>2020 Census Overall</b>	0.5%	2.8%	6.5%	11.5%
Self-Response	0.7%	1.9%	1.1%	1.5%
Enumerator Return	<0.1%	6.6%	25.1%	56.8%

Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

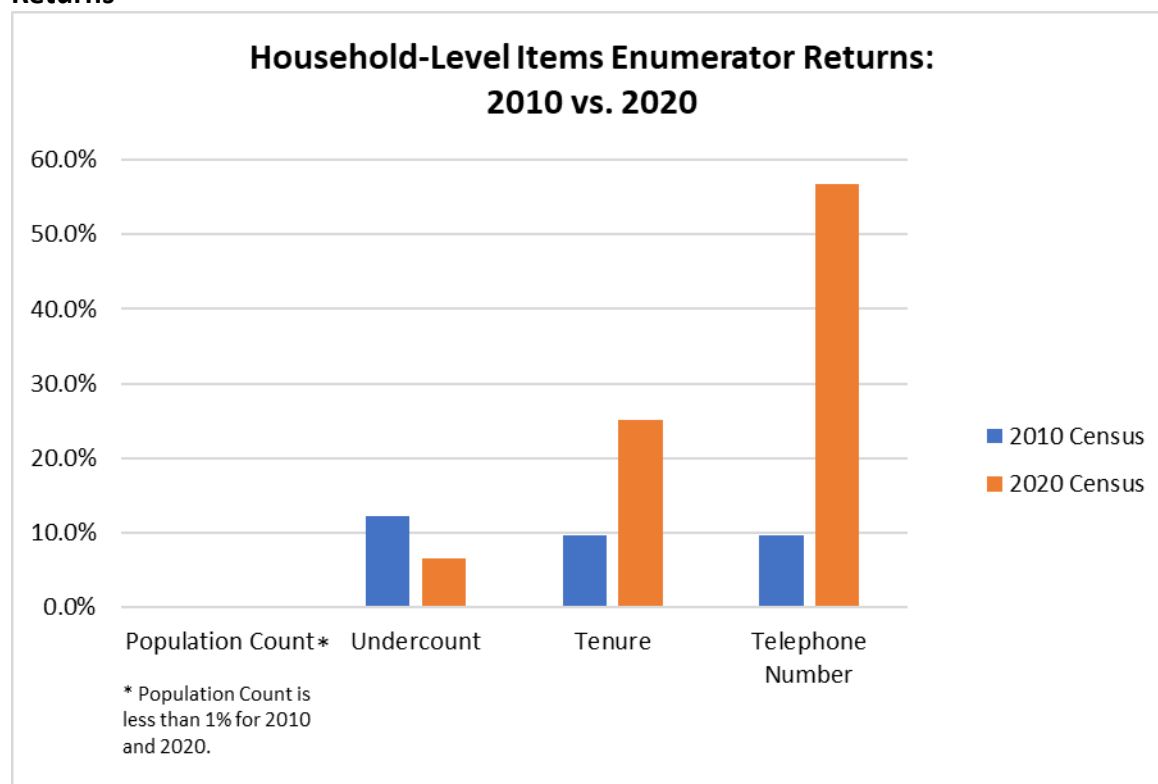
Overall, the 2020 Census had lower item nonresponse rates than 2010 for population count and undercount. Among self-response returns, 2020 had lower item nonresponse rates than 2010 for all items. For enumerator returns, 2020 had a lower item nonresponse rate for undercount and the same rate as 2010 for population count. Like 2010, the 2020 self-response returns had lower rates than enumerator returns for all items, except for population count.

**Figure 6. 2010 and 2020 Item Nonresponse Rate Comparison of Household-Level Items: Self-Response**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

**Figure 7. 2010 and 2020 Item Nonresponse Rate Comparison of Household-Level Items: Enumerator Returns**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

Table M compares 2010 and 2020 person-level item nonresponse rates. Figure 8 compares self-response rates and Figure 9 compares enumerator return rates.

**Table M. 2010 and 2020 Item Nonresponse Rate Comparison of Person-Level Items**

	Sex	Age/ Date of Birth*	Hispanic Origin	Race	Overcount	Relationship
<b>2010 Census Overall</b>	1.5%	3.5%	3.9%	3.3%	2.3%	1.5%
Self-Response	1.7%	0.8%	4.2%	3.3%	1.4%	1.1%
Enumerator Return	1.0%	10.0%	3.3%	3.4%	4.9%	2.4%
GQ Enumeration	3.0%	6.5%	25.0%	18.1%	n/a	n/a

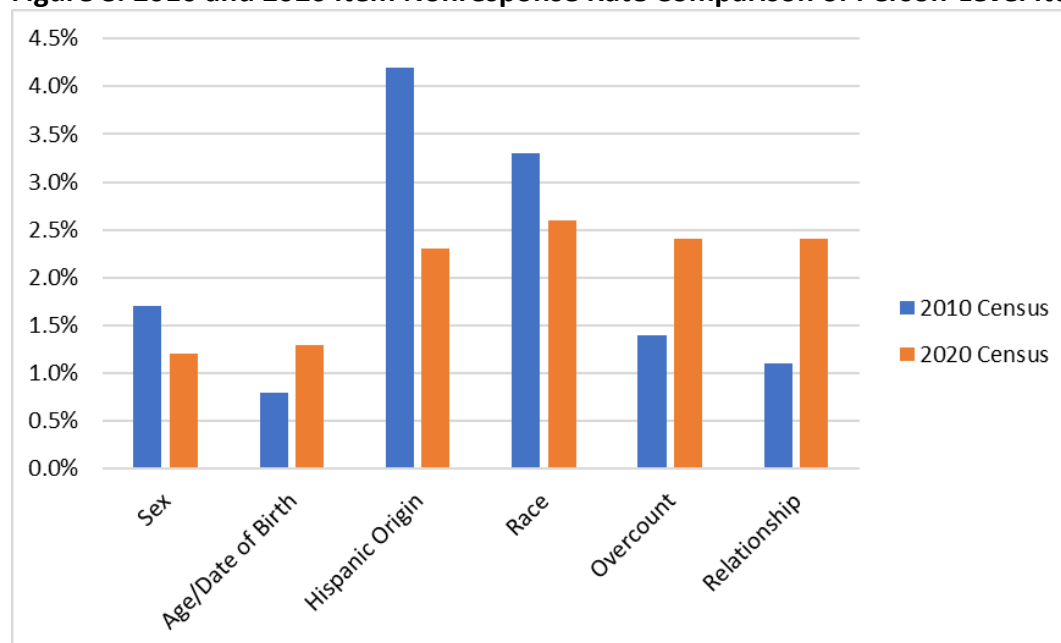
	Sex	Age/ Date of Birth*	Hispanic Origin	Race	Overcount	Relationship
<b>2020 Census Overall</b>	3.1%	8.2%	6.3%	6.4%	5.4%	5.9%
Self-Response	1.2%	1.3%	2.3%	2.6%	2.4%	2.4%
Enumerator Return	7.7%	22.5%	16.2%	16.9%	13.9%	18.1%
GQ Enumeration	22.0%	17.8%	43.9%	30.2%	n/a	n/a

Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

\*The 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report's definition of an adequate NRFU age/date of birth response required answers for both age and date of birth (Rothhaas, 2012). The 2020 Census Item Nonresponse and Imputation Assessment Report's definition of an adequate age/date of birth response for all modes was if either age or year of birth was provided.

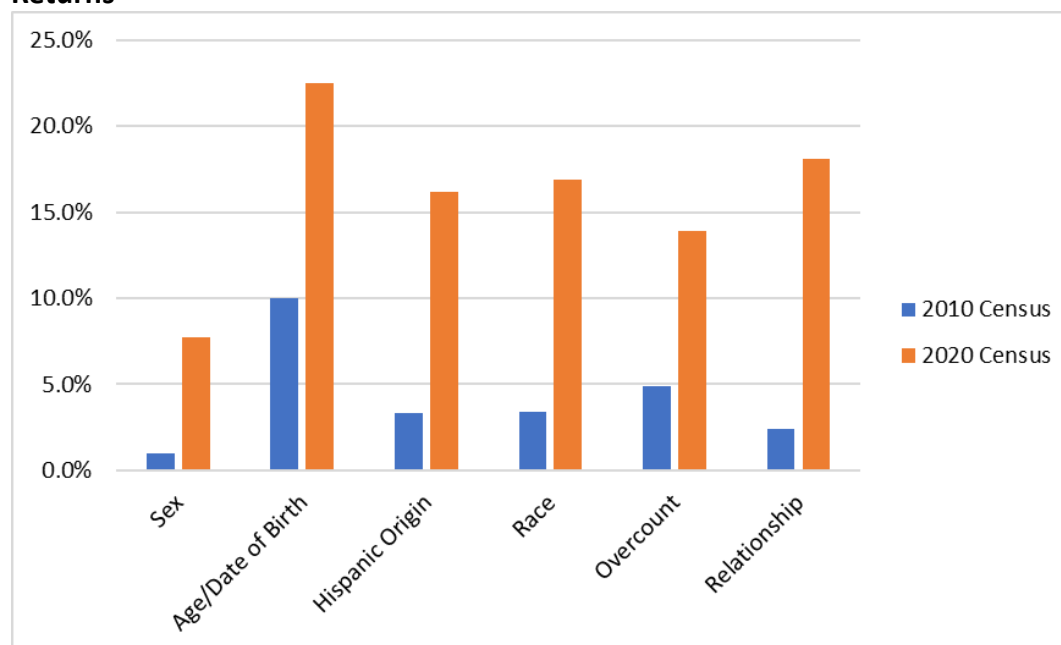
Overall, 2020 had higher item nonresponse rates than 2010 for all person-level items. Self-response 2020 returns had lower item nonresponse rates than 2010 for sex, Hispanic origin, and race. Lower self-response INR rates in 2020 compared to 2010 are likely, in part, because of the introduction of the internet mode of response, which used soft edits to remind people to answer a question if they tried to skip it. 2020 Self-Response INR rates were generally low, ranging from 1.2 percent for sex to 2.6 percent for race. Enumerator 2020 returns had a higher item nonresponse rate than 2010 for all items. For GQ enumerations, 2020 had higher item nonresponse rates than 2010 for all applicable items. The COVID-19 pandemic greatly impacted Group Quarters operations, which likely contributed to the higher item nonresponse rates in 2020.

**Figure 8. 2010 and 2020 Item Nonresponse Rate Comparison of Person-Level Items: Self-Response**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

**Figure 9. 2010 and 2020 Item Nonresponse Rate Comparison of Person-Level Items: Enumerator Returns**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.



Table N compares 2010 and 2020 nonimputation and imputation rates. Figure 10 shows self-response imputation rates and Figure 11 shows enumerator return imputation rates.

**Table N. 2010 and 2020 Comparison of Nonimputed and Imputed Rates**

	Tenure	Sex	Age/Date of Birth	Hispanic Origin	Race	Relationship
<b>2010 Census Overall</b>						
Nonimputed	96.5%	98.4%	95.0%	95.5%	95.9%	97.9%
Imputed	3.5%	1.6%	5.1%	4.5%	4.1%	2.1%
Assigned	n/a*	1.3%	1.5%	1.7%	1.2%	0.5%
Allocated	3.5%	0.3%	3.6%	2.8%	2.9%	1.7%
<b>Self-Response</b>						
Nonimputed	97.4%	98.3%	98.1%	95.2%	95.8%	98.3%
Imputed	2.6%	1.8%	1.9%	4.8%	4.2%	1.7%
Assigned	n/a*	1.6%	1.1%	2.0%	1.3%	0.3%
Allocated	2.6%	0.2%	0.7%	2.8%	2.9%	1.4%
<b>Enumerator Return</b>						
Nonimputed	94.1%	99.0%	87.7%	96.7%	96.3%	97.1%
Imputed	5.9%	1.0%	12.3%	3.3%	3.7%	2.9%
Assigned	n/a*	0.7%	2.4%	0.9%	1.0%	0.9%
Allocated	5.9%	0.3%	9.9%	2.4%	2.7%	2.0%
<b>GQ Enumeration</b>						
Nonimputed	n/a	96.2%	91.4%	74.3%	81.1%	n/a
Imputed	n/a	3.8%	8.6%	25.7%	19.0%	n/a
Assigned	n/a	2.4%	1.2%	13.7%	9.8%	n/a
Allocated	n/a	1.4%	7.5%	11.9%	9.2%	n/a
<b>2020 Census Overall</b>						
Nonimputed	92.4%	93.8%	85.2%	91.3%	90.8%	92.0%
Imputed	7.6%	6.2%	14.8%	8.7%	9.2%	8.0%
Assigned	1.9%	5.8%	8.7%	4.7%	4.9%	2.1%
Allocated	5.7%	0.4%	6.1%	4.0%	4.3%	5.9%
<b>Self-Response</b>						
Nonimputed	98.8%	98.7%	96.4%	97.6%	97.2%	96.6%
Imputed	1.2%	1.3%	3.6%	2.4%	2.8%	3.4%
Assigned	0.3%	1.2%	2.6%	1.5%	1.8%	0.9%
Allocated	0.9%	0.1%	1.0%	0.9%	1.0%	2.5%

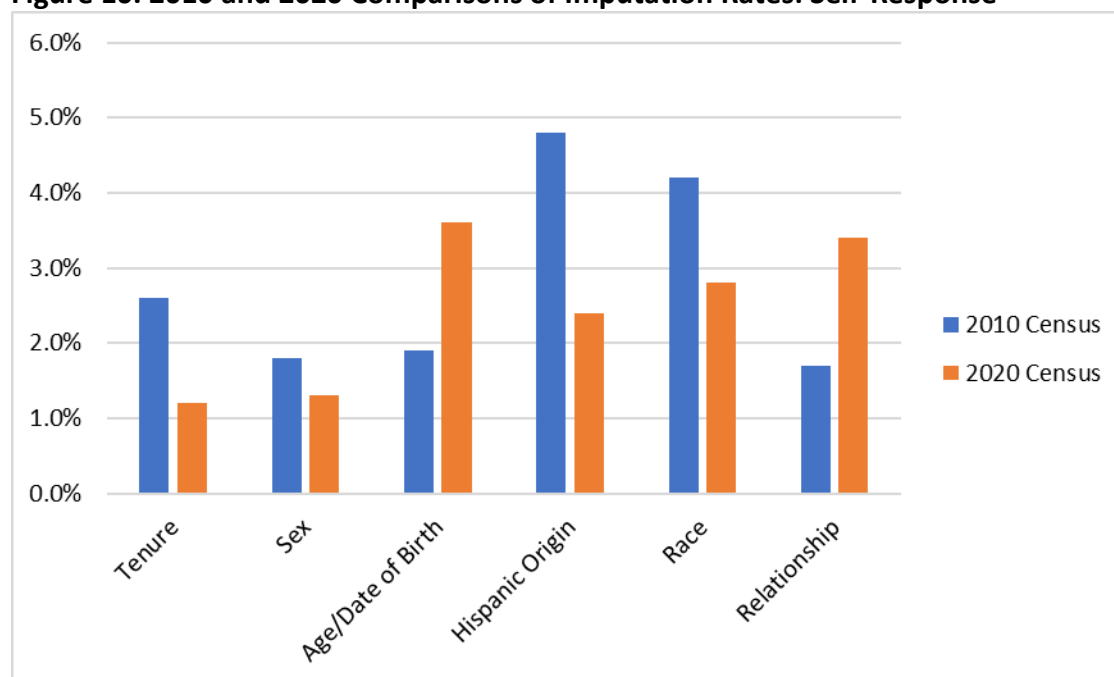
	Tenure	Sex	Age/Date of Birth	Hispanic Origin	Race	Relationship
<b>Enumerator Return</b>						
Nonimputed	70.1%	78.1%	47.5%	73.2%	71.0%	76.0%
Imputed	29.9%	21.9%	52.5%	26.8%	29.0%	24.0%
Assigned	7.5%	20.9%	29.9%	13.9%	15.2%	6.4%
Allocated	22.4%	1.1%	22.6%	12.9%	13.8%	17.6%
<b>GQ Enumeration</b>						
Nonimputed	n/a	78.0%	69.7%	53.8%	67.1%	n/a
Imputed	n/a	22.0%	30.3%	46.2%	32.9%	n/a
Assigned	n/a	15.9%	12.0%	24.9%	11.1%	n/a
Allocated	n/a	6.1%	18.3%	21.3%	21.7%	n/a

Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Edited File.

\*Tenure could not be assigned in the 2010 Census in the absence of long-form data.

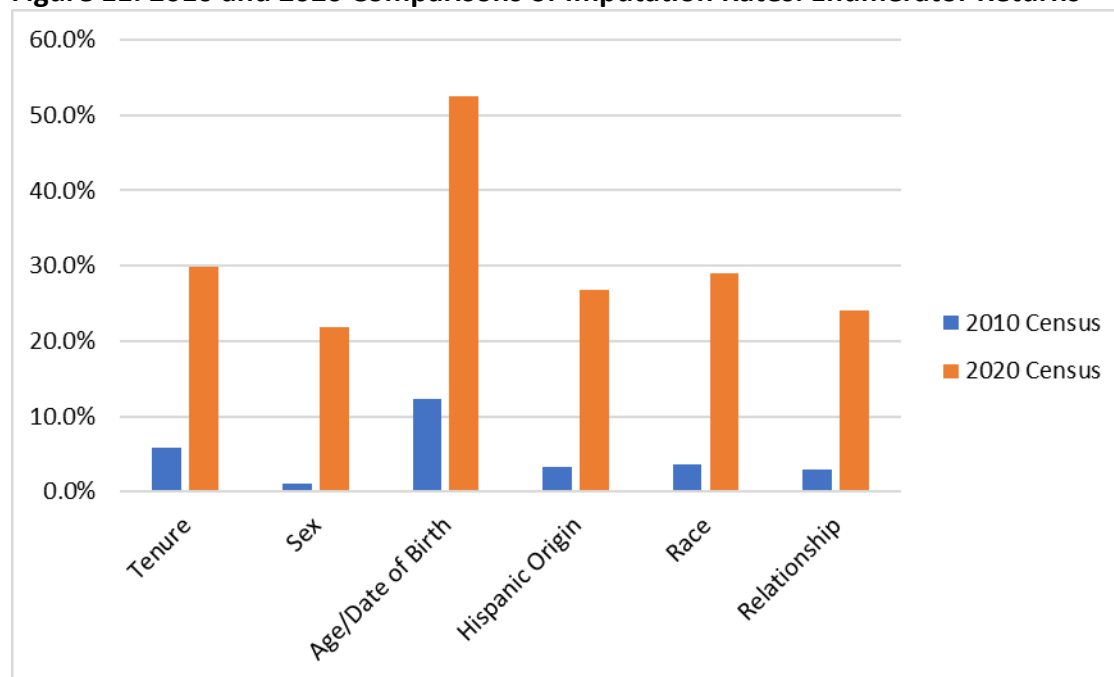
Overall, 2010 had lower imputation rates than 2020 for all items. 2010 also had lower imputation rates for all items from enumerator and GQ enumeration returns. Within self-response returns, 2020 had lower imputation rates than 2010 for tenure, sex, Hispanic origin, and race.

**Figure 10. 2010 and 2020 Comparisons of Imputation Rates: Self-Response**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Edited File.

**Figure 11. 2010 and 2020 Comparisons of Imputation Rates: Enumerator Returns**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Edited File.

## 6. Conclusions and Recommendations

This assessment provides 2020 Census item nonresponse (INR) and imputation rates for self-response modes, enumerator operations, and group quarters operations. The items examined in the report included population count, undercount, tenure, telephone number, relationship, sex, age/date of birth, Hispanic origin, race, overcount, and the population count only metric. The assessment also compares 2020 Census INR and imputation rates to the corresponding 2010 Census rates. Recommendations are provided based on analysis from this assessment.

### 6.1 Conclusions

Within Overall Self-Response (TEA 1 and 6) for Tables A and B, internet had the lowest INR rates for the tenure, telephone number, Hispanic origin, race, and relationship items. Moreover, Overall Self-Response internet INR rates ranged from 0.2 percent for the telephone number item to 2.7 percent for the overcount item. Phone had the lowest INR rate for undercount. Paper had the lowest INR rates for the sex, age/date of birth, overcount, and population count only items. The highest rates in the self-response returns are seen in the bilingual paper modes for undercount (19.6 percent) and race (23.9 percent). The internet and phone modes were split out by ID and non-ID returns. INR rates for non-ID were higher for all items in Overall Self-Response (TEA 1 and 6) and Self-Response (TEA 1). The

population count only item was less than 1 percent for all modes within Overall Self-Response, except for internet non-ID. Within enumerator returns, Coverage Improvement had the lowest INR rates. The highest INR rate for NRFU was the age/date of birth item, which was 28.4 percent.

The INR rates for GQs were relatively high for all items. In particular, Hispanic origin INR rates were greater than 22 percent across all GQ types. Institutional types of GQs had lower INR rates than noninstitutional GQs.

All items within self-response modes had low imputation rates of less than 8 percent. Internet had the lowest imputation rates for all items, except for sex, within Overall Self-Response. For the imputation rates of enumerator returns, Coverage Improvement had the lowest imputation rates for the tenure, sex, and age/date of birth items. Rural Alaska had the lowest imputation rates for the Hispanic origin, race, and relationship items. The sex item had the lowest imputation rate for NRFU returns. The age/date of birth item had the highest imputation rates for every type of enumerator return, apart from Coverage Improvement, Rural Alaska, and AR enumerations.

The sex item had the lowest imputation rates for all GQ types, while Hispanic origin had the highest imputation rates. The institutional types of GQs had lower imputation rates than the noninstitutional types of GQs.

Paper was the self-response mode with the highest rates of administrative records usage for all items, except for tenure and age/date of birth. For NRFU, tenure had the highest administrative records usage rate of 37.5 percent.

Totally allocated persons accounted for 0.6 percent of the Table H cases. For self-response modes, paper had the lowest totally allocated rates and internet had the highest rates. Substituted persons make up 2.2 percent of cases in Table I.

In terms of the completeness statistic, the rate of persons with five out of five nonimputed item responses was higher than 80 percent for all modes within Overall Self-Response. Internet had the highest rate of 94.9 percent. Coverage Improvement had the highest rate of five out of five nonimputed person-level responses within enumerator returns.

Overall, the 2020 Census had higher INR rates than 2010 for all items, except for the population count and undercount items. For self-response returns, 2020 had lower item nonresponse rates for all items, except for age/date of birth, overcount, and relationship. Within enumerator returns, 2020 had higher INR rates for all items except for undercount and population count. For GQ enumerations, 2020 had higher INR rates than 2010 for all items. The imputation rate comparisons show that 2010 had lower imputation rates than 2020 for all items overall, within enumerator returns, and for GQ enumerations.

For self-response returns, 2020 had lower imputation rates than 2010 for tenure, sex, Hispanic origin, and race.

This assessment provides extensive INR and imputation results across multiple modes and operations. While the results are varied, some patterns emerged. Overall self-response INR rates were low. Self-response returns had lower INR and imputation rates than enumerator returns for all items, except population count. Moreover, non-ID returns had higher INR rates than ID returns, except for the Update Leave phone mode. GQ enumerations INR and imputation rates were relatively high. In addition, the lower self-response INR rates in 2020 compared to 2010 are likely, in part, because of the introduction of the internet mode of response.

## 6.2 Recommendations

1. Continue to implement the use of soft edits in the internet instrument. Introduction of the internet instrument in the 2020 Census contributed to lower self-response item nonresponse rates than in the 2010 Census for most questions. The internet instrument helps reduce INR rates because it features soft edits and reminds people to provide a response if they attempt to skip a question.
2. Research how to increase unit response to decrease item nonresponse. Populations residing in group quarters are considered hard to reach. In 2020, the COVID-19 pandemic further added to enumeration difficulties and was probably an important factor contributing to the high GQ item nonresponse.

## 7. Review/Approval Table

Role	Approval Date
Decennial Census Management Division (DCMD) ADC for Item Nonresponse	10/4/2022
Decennial Research Objectives and Methods (DROM) Working Group	9/6/2022
Decennial Communications Coordination Office (DCCO)	2/7/2023

## 8. Document Revision and Version Control History

Version/Editor	Date	Revision Description
1.0/Bernstein	2/7/2023	Final version approved for public

## 9. Acknowledgements

We would like to acknowledge our former colleague, Tracae McClure, for contributing to the analysis for this report.

## 10. References

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## Appendix A: Glossary of Acronyms

Acronym	Definition
ACS	American Community Survey
AR	Administrative Records
CEF	Census Edited File
CFU	Coverage Followup
Cov. Imp.	Coverage Improvement
CQA	Census Questionnaire Assistance
CQS	Census Quality Survey
CUF	Census Unedited File
DCCO	Decennial Communications Coordination Office
DCMD	Decennial Census Management Division
DDP	Data Defined Person
DROM	Decennial Research Objectives and Methods Working Group
DSSD	Decennial Statistical Studies Division
ETL	Enumeration of Transitory Locations
GQ	Group Quarters
HU	Housing Unit
INR	Item Nonresponse
IPT	Integrated Project Team
ISR	Internet Self-Response
NCT	National Census Test, National Content Test
NRFU	Nonresponse Followup
PSA	Primary Selection Algorithm
RA	Remote Alaska
RI	Reinterview
TEA	Type of Enumeration Area
TQA	Telephone Questionnaire Assistance
UE	Update Enumerate
UL	Update Leave

## Appendix B: 2020 State-Level Tables

**Table A1. 2020 Census Item Nonresponse Rates for Overall Self-Response Household-Level Items – States**

	Percent Item Nonresponse				
	Population Count	Undercount	Tenure	Telephone Number	Population Count Only
<b>Overall Self-Response (TEA 1 and 6)</b>					
Alabama	3.4%	2.5%	1.2%	1.7%	0.4%
Alaska	2.9%	1.7%	1.2%	1.4%	0.5%
Arizona	3.9%	2.0%	1.1%	1.6%	0.5%
Arkansas	3.6%	2.6%	1.3%	2.0%	0.4%
California	3.9%	2.2%	1.2%	1.3%	0.6%
Colorado	3.5%	1.4%	0.9%	1.2%	0.4%
Connecticut	4.1%	1.9%	1.0%	1.5%	0.5%
Delaware	3.2%	1.6%	0.9%	1.3%	0.5%
District of Columbia	5.1%	1.9%	1.0%	1.1%	0.5%
Florida	4.3%	2.4%	1.3%	1.6%	0.5%
Georgia	4.0%	2.1%	1.3%	1.5%	0.5%
Hawaii	3.9%	2.2%	1.3%	1.6%	0.7%
Idaho	3.4%	1.5%	1.0%	1.5%	0.4%
Illinois	3.4%	1.7%	0.9%	1.4%	0.4%
Indiana	3.0%	1.7%	0.9%	1.6%	0.3%
Iowa	2.9%	1.4%	0.8%	1.4%	0.3%
Kansas	3.0%	1.6%	0.9%	1.5%	0.3%
Kentucky	3.6%	2.0%	1.1%	1.7%	0.3%
Louisiana	4.2%	2.6%	1.5%	1.8%	0.5%
Maine	2.8%	1.9%	1.0%	2.0%	0.4%
Maryland	3.5%	1.6%	0.9%	1.1%	0.5%
Massachusetts	4.0%	1.9%	1.0%	1.4%	0.5%
Michigan	3.1%	1.6%	0.9%	1.5%	0.3%
Minnesota	3.3%	1.2%	0.8%	1.2%	0.3%
Mississippi	3.7%	3.2%	1.6%	2.2%	0.4%
Missouri	3.3%	1.8%	1.0%	1.7%	0.3%
Montana	3.4%	1.9%	1.1%	2.0%	0.4%
Nebraska	3.5%	1.6%	0.9%	1.5%	0.3%
Nevada	3.9%	1.9%	1.1%	1.3%	0.6%
New Hampshire	2.7%	1.4%	0.9%	1.6%	0.4%
New Jersey	3.9%	1.9%	1.0%	1.2%	0.6%



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	Percent Item Nonresponse				
	Population Count	Undercount	Tenure	Telephone Number	Population Count Only
New Mexico	3.9%	2.2%	1.2%	1.6%	0.5%
New York	4.2%	2.5%	1.4%	1.7%	0.7%
North Carolina	3.3%	1.9%	1.0%	1.5%	0.4%
North Dakota	3.9%	1.5%	0.9%	1.2%	0.3%
Ohio	3.0%	1.7%	0.9%	1.7%	0.3%
Oklahoma	3.7%	2.2%	1.2%	1.8%	0.4%
Oregon	3.7%	1.6%	1.0%	1.6%	0.4%
Pennsylvania	3.4%	1.8%	1.0%	1.6%	0.4%
Rhode Island	3.6%	2.0%	1.1%	1.8%	0.5%
South Carolina	3.7%	2.2%	1.2%	1.6%	0.4%
South Dakota	3.1%	1.5%	0.8%	1.6%	0.3%
Tennessee	3.2%	2.0%	1.1%	1.7%	0.4%
Texas	4.0%	2.0%	1.1%	1.3%	0.5%
Utah	3.2%	1.2%	0.8%	0.8%	0.5%
Vermont	2.6%	1.6%	0.8%	1.6%	0.4%
Virginia	3.3%	1.6%	0.9%	1.2%	0.4%
Washington	3.5%	1.4%	0.9%	1.3%	0.4%
West Virginia	3.1%	2.5%	1.1%	2.0%	0.4%
Wisconsin	3.0%	1.3%	0.7%	1.2%	0.3%
Wyoming	2.9%	1.7%	1.0%	1.8%	0.4%
Puerto Rico	5.6%	4.2%	2.6%	2.6%	0.6%

Source: U.S. Census Bureau, 2020 Census Unedited File.

**Table A2. 2020 Census Item Nonresponse Rates for Overall Self-Response Person-Level Items  
– States**

	Percent Item Nonresponse					
	Sex	Age/Date of Birth	Hispanic Origin	Race	Overcount	Relationship
<b>Overall Self-Response (TEA 1 and 6)</b>						
Alabama	1.0%	1.0%	3.0%	1.6%	2.3%	2.6%
Alaska	1.3%	1.3%	2.1%	1.9%	2.3%	2.7%
Arizona	1.5%	1.6%	2.3%	3.8%	2.3%	2.7%
Arkansas	1.1%	1.1%	2.7%	1.9%	2.0%	2.3%
California	1.7%	1.7%	2.4%	4.8%	3.0%	2.9%
Colorado	1.2%	1.3%	1.8%	2.8%	2.1%	2.3%
Connecticut	1.2%	1.3%	2.1%	2.5%	2.7%	2.3%
Delaware	1.2%	1.3%	2.3%	2.0%	2.2%	2.3%
District of Columbia	1.3%	1.4%	2.7%	1.9%	2.9%	3.9%
Florida	1.3%	1.3%	2.2%	2.6%	2.7%	2.6%
Georgia	1.3%	1.4%	2.6%	2.1%	2.4%	2.6%
Hawaii	1.8%	1.9%	3.2%	2.3%	2.8%	3.4%
Idaho	1.1%	1.2%	1.7%	2.2%	1.8%	1.9%
Illinois	1.1%	1.2%	2.1%	2.4%	2.6%	2.4%
Indiana	1.0%	1.0%	2.0%	1.8%	1.7%	2.0%
Iowa	0.9%	0.9%	1.7%	1.6%	1.6%	1.7%
Kansas	0.9%	1.0%	1.7%	2.0%	1.8%	1.8%
Kentucky	0.9%	0.9%	2.2%	1.5%	1.9%	2.1%
Louisiana	1.2%	1.2%	3.3%	1.7%	2.6%	2.9%
Maine	1.1%	1.1%	2.1%	1.6%	1.8%	2.3%
Maryland	1.2%	1.2%	2.1%	1.9%	2.5%	2.2%
Massachusetts	1.2%	1.2%	2.0%	2.2%	2.7%	2.4%
Michigan	0.9%	1.0%	2.1%	1.6%	2.0%	2.0%
Minnesota	0.8%	0.9%	1.5%	1.4%	1.7%	1.7%
Mississippi	1.1%	1.2%	4.1%	1.6%	2.2%	2.9%
Missouri	1.0%	1.0%	2.1%	1.6%	1.8%	2.0%
Montana	1.0%	1.1%	2.0%	1.6%	2.0%	2.5%
Nebraska	0.9%	0.9%	1.7%	1.8%	1.7%	1.7%
Nevada	1.5%	1.5%	2.2%	3.5%	2.7%	2.7%
New Hampshire	1.1%	1.2%	1.8%	1.7%	1.8%	2.1%
New Jersey	1.3%	1.4%	2.2%	2.6%	3.1%	2.5%
New Mexico	1.4%	1.4%	2.5%	4.8%	2.8%	3.1%
New York	1.6%	1.6%	2.8%	3.1%	3.3%	3.4%

	Percent Item Nonresponse					
	Sex	Age/Date of Birth	Hispanic Origin	Race	Overcount	Relationship
<b>Overall Self-Response (TEA 1 and 6)</b>						
North Carolina	1.1%	1.2%	2.5%	1.9%	2.2%	2.3%
North Dakota	0.9%	0.9%	1.7%	1.3%	1.8%	1.9%
Ohio	0.9%	1.0%	2.1%	1.5%	1.8%	1.9%
Oklahoma	1.0%	1.1%	2.2%	2.1%	1.9%	2.2%
Oregon	1.2%	1.3%	1.9%	2.3%	2.0%	2.3%
Pennsylvania	0.9%	1.0%	2.1%	1.8%	2.0%	2.0%
Rhode Island	1.2%	1.2%	2.1%	2.4%	2.7%	2.4%
South Carolina	1.1%	1.2%	3.0%	1.7%	2.1%	2.4%
South Dakota	0.9%	1.0%	1.9%	1.5%	1.7%	1.9%
Tennessee	1.1%	1.1%	2.5%	1.7%	1.9%	2.2%
Texas	1.4%	1.5%	2.2%	3.9%	2.6%	2.6%
Utah	1.4%	1.4%	1.8%	2.4%	2.1%	2.2%
Vermont	1.0%	1.0%	1.8%	1.4%	1.9%	2.1%
Virginia	1.1%	1.1%	2.2%	1.8%	2.1%	2.1%
Washington	1.2%	1.2%	1.8%	2.2%	2.2%	2.2%
West Virginia	1.0%	1.0%	2.6%	1.6%	1.9%	2.4%
Wisconsin	0.8%	0.8%	1.6%	1.4%	1.7%	1.6%
Wyoming	1.1%	1.2%	1.9%	2.0%	1.8%	2.2%
Puerto Rico	1.9%	1.7%	1.9%	5.3%	4.8%	4.3%

Source: U.S. Census Bureau, 2020 Census Unedited File.

**Table A3. 2020 Census Item Nonresponse Rates for Group Quarters – States**

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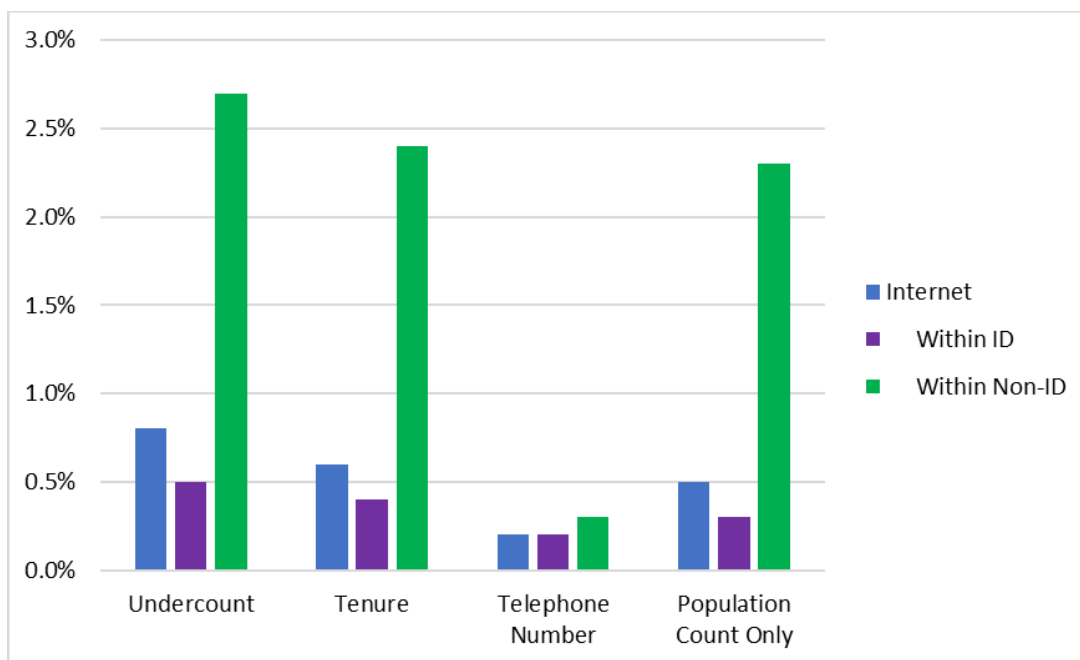
	Percent Item Nonresponse			
	Sex	Age/Date of Birth	Hispanic Origin	Race
<b>Overall (Institutional &amp; Noninstitutional)</b>				
Alabama	15.0%	22.0%	37.5%	20.6%
Alaska	15.6%	30.4%	64.1%	54.8%
Arizona	16.3%	11.2%	43.6%	32.9%
Arkansas	3.5%	4.5%	13.9%	13.9%
California	35.6%	27.7%	54.3%	43.5%
Colorado	15.8%	14.5%	36.7%	32.5%
Connecticut	21.8%	10.1%	46.4%	34.4%
Delaware	37.1%	40.2%	39.9%	42.0%
District of Columbia	53.5%	20.5%	63.5%	56.4%
Florida	15.5%	14.5%	33.7%	19.1%
Georgia	22.6%	20.1%	41.3%	26.8%
Hawaii	51.5%	56.7%	64.7%	58.2%
Idaho	2.9%	5.0%	52.1%	10.6%
Illinois	14.9%	11.3%	44.4%	22.9%
Indiana	9.0%	5.0%	41.8%	21.2%
Iowa	20.4%	18.8%	38.1%	30.2%
Kansas	12.9%	9.0%	44.7%	17.8%
Kentucky	11.4%	8.6%	33.3%	16.0%
Louisiana	7.9%	10.7%	61.1%	33.8%
Maine	29.7%	19.2%	41.6%	38.3%
Maryland	25.0%	12.0%	44.9%	34.8%
Massachusetts	38.0%	17.4%	46.1%	40.4%
Michigan	33.1%	27.3%	40.3%	32.5%
Minnesota	27.2%	21.0%	42.5%	32.0%
Mississippi	14.2%	6.4%	39.7%	12.7%
Missouri	29.2%	26.6%	43.4%	35.7%
Montana	12.0%	10.5%	21.0%	12.8%
Nebraska	19.4%	14.5%	38.8%	23.0%
Nevada	6.5%	6.1%	31.2%	18.1%
New Hampshire	44.1%	44.9%	55.7%	48.6%
New Jersey	19.6%	23.0%	43.8%	35.8%
New Mexico	13.6%	16.2%	40.0%	25.0%
New York	25.6%	20.3%	47.6%	32.4%
North Carolina	20.1%	12.1%	50.8%	23.5%
North Dakota	25.6%	25.8%	45.6%	34.6%

	Percent Item Nonresponse			
	Sex	Age/Date of Birth	Hispanic Origin	Race
<b>Overall (Institutional &amp; Noninstitutional)</b>				
Ohio	26.0%	20.7%	38.0%	28.7%
Oklahoma	13.5%	19.3%	43.1%	27.5%
Oregon	25.4%	26.4%	44.7%	35.6%
Pennsylvania	24.9%	19.1%	41.7%	30.8%
Rhode Island	29.4%	18.6%	66.8%	43.0%
South Carolina	9.8%	8.0%	30.6%	16.7%
South Dakota	4.3%	6.5%	32.6%	21.4%
Tennessee	12.8%	12.6%	53.1%	24.1%
Texas	12.8%	13.0%	36.0%	22.7%
Utah	14.2%	20.0%	44.8%	35.6%
Vermont	17.0%	15.2%	56.8%	51.7%
Virginia	23.0%	17.4%	51.0%	34.6%
Washington	15.7%	17.4%	44.0%	37.1%
West Virginia	18.0%	3.1%	22.6%	15.8%
Wisconsin	26.0%	17.4%	47.7%	26.7%
Wyoming	3.1%	8.2%	29.2%	25.6%
Puerto Rico	2.6%	1.5%	19.8%	22.6%

Source: U.S. Census Bureau, 2020 Census Unedited File.

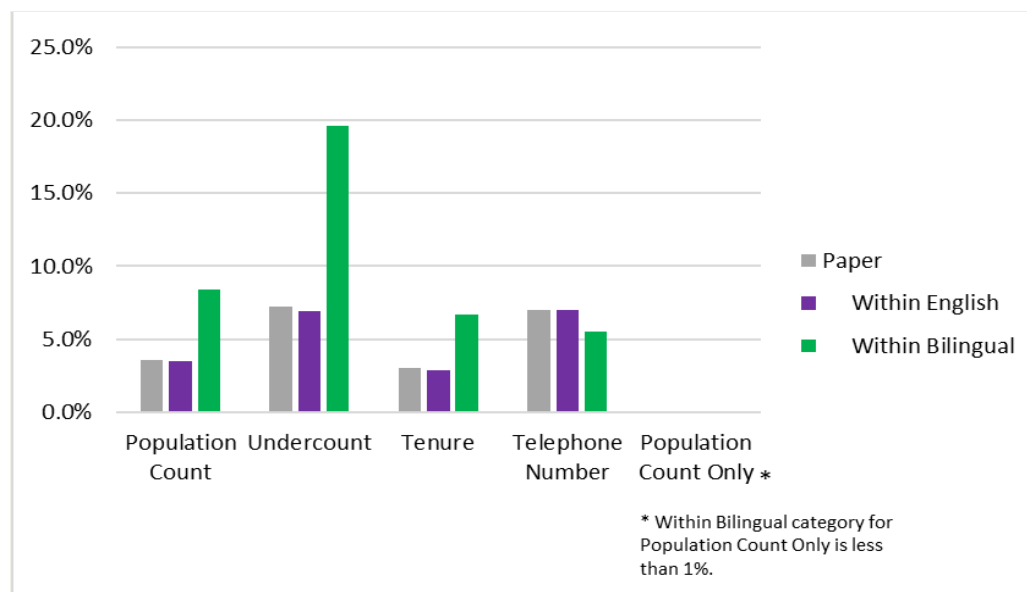
## Appendix C: Additional Figures

**Figure 12. 2020 Census Overall Self-Response Item Nonresponse Rates for Household-Level Items: Internet ID Status (Table A)**



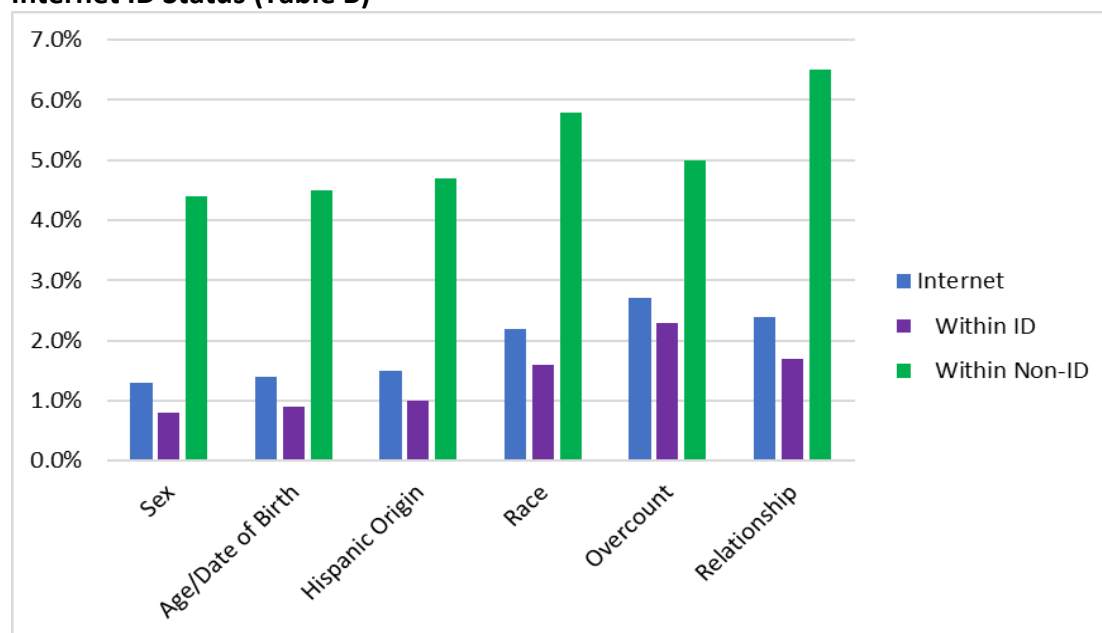
Source: U.S. Census Bureau, 2020 Census Unedited File.

**Figure 13. 2020 Census Overall Self-Response Item Nonresponse Rates for Household-Level Items: Paper Language (Table A)**



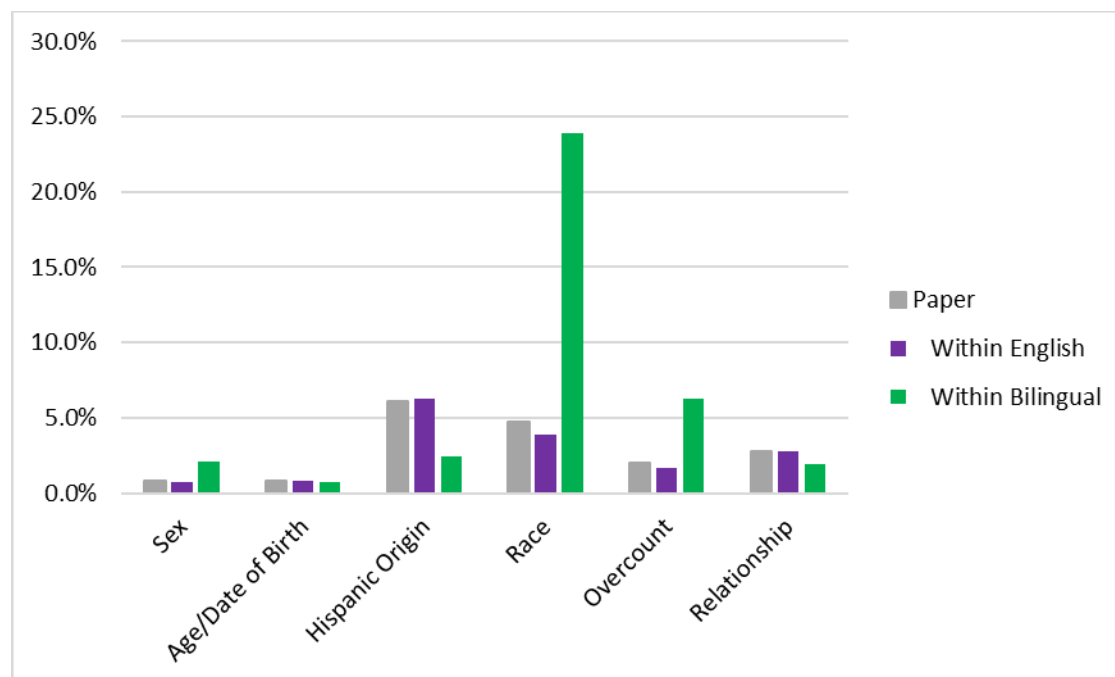
Source: U.S. Census Bureau, 2020 Census Unedited File.

**Figure 14. 2020 Census Overall Self-Response Item Nonresponse Rates for Person-Level Items: Internet ID Status (Table B)**



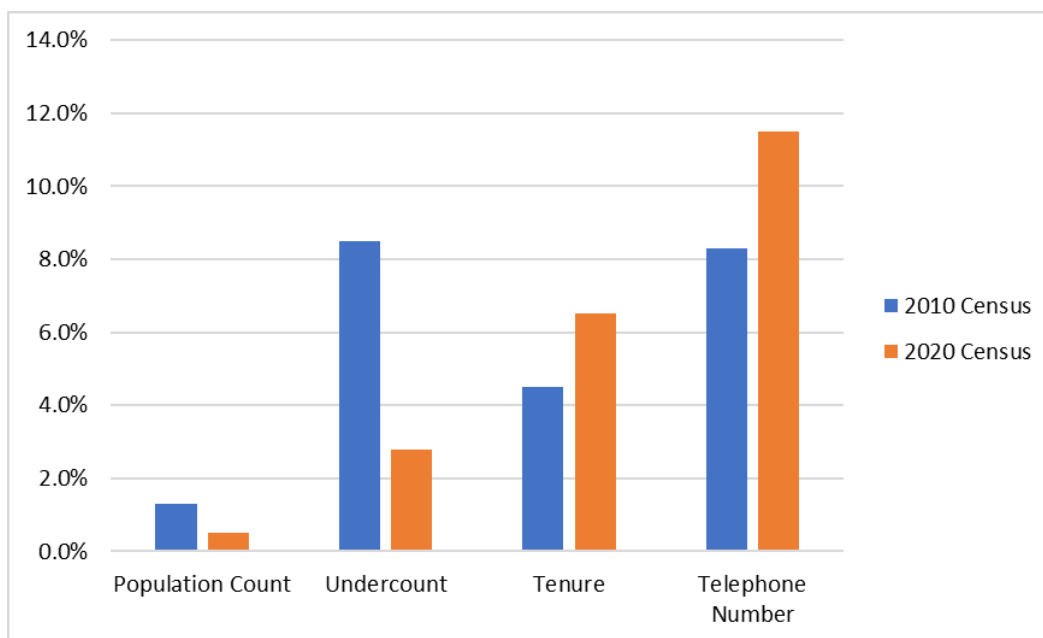
Source: U.S. Census Bureau, 2020 Census Unedited File.

**Figure 15. 2020 Census Overall Self-Response Item Nonresponse Rates for Person-Level Items: Paper Language (Table B)**



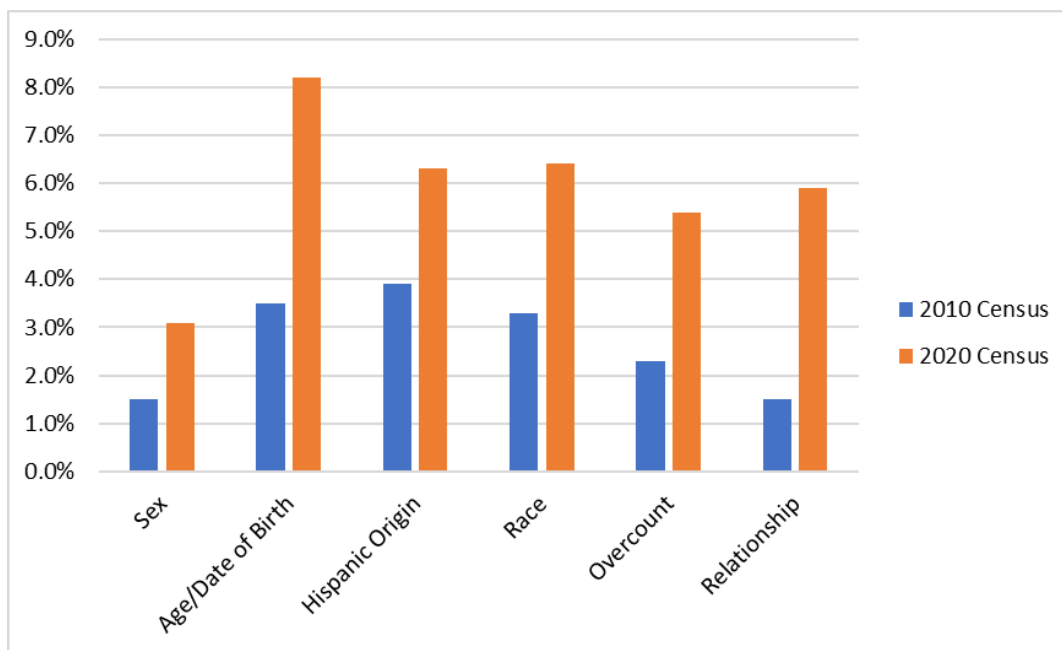
Source: U.S. Census Bureau, 2020 Census Unedited File.

**Figure 16. 2010 and 2020 Item Nonresponse Rate Comparison of Household-Level Items: Overall (Table L)**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

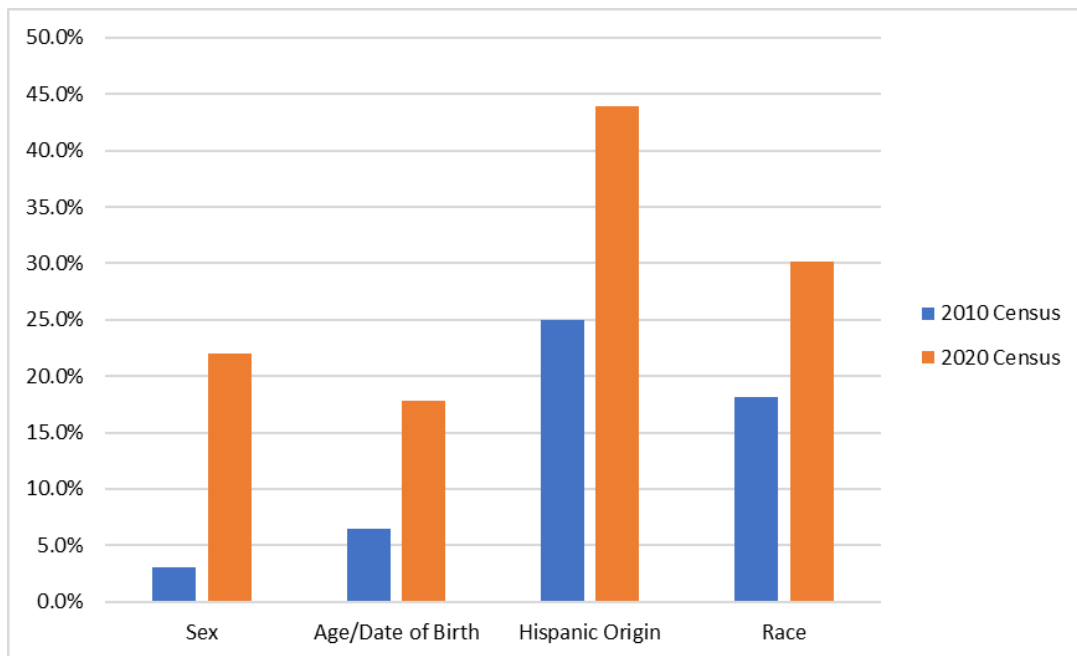
**Figure 17. 2010 and 2020 Item Nonresponse Rate Comparison of Person-Level Items: Overall (Table M)**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

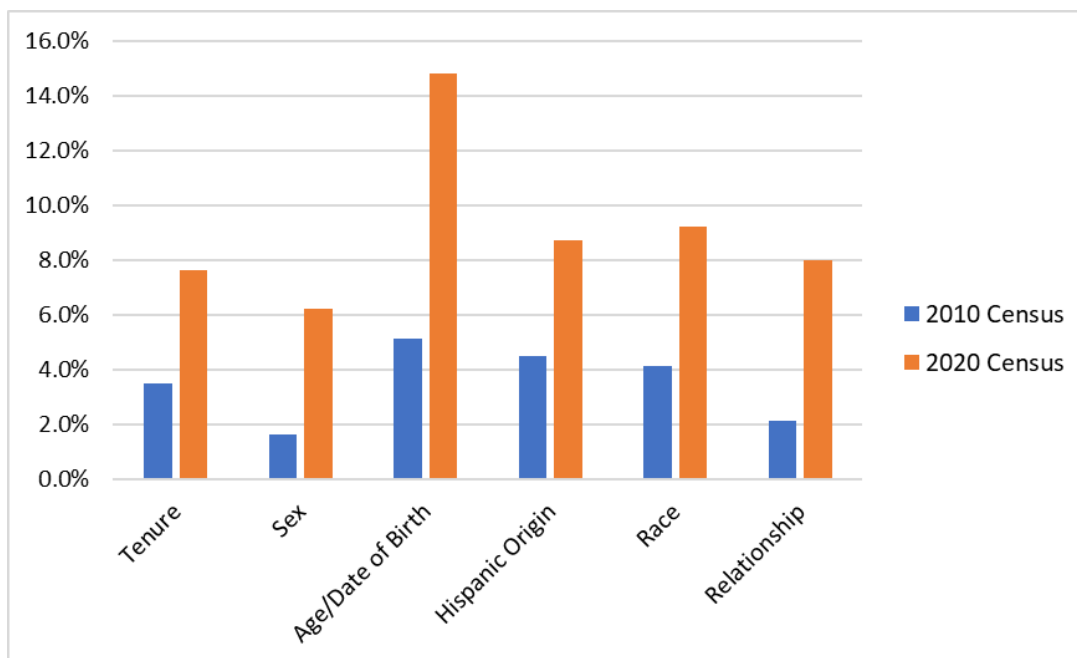


**Figure 18. 2010 and 2020 Item Nonresponse Rate Comparison of Person-Level Items: GQ Enumerations (Table M)**



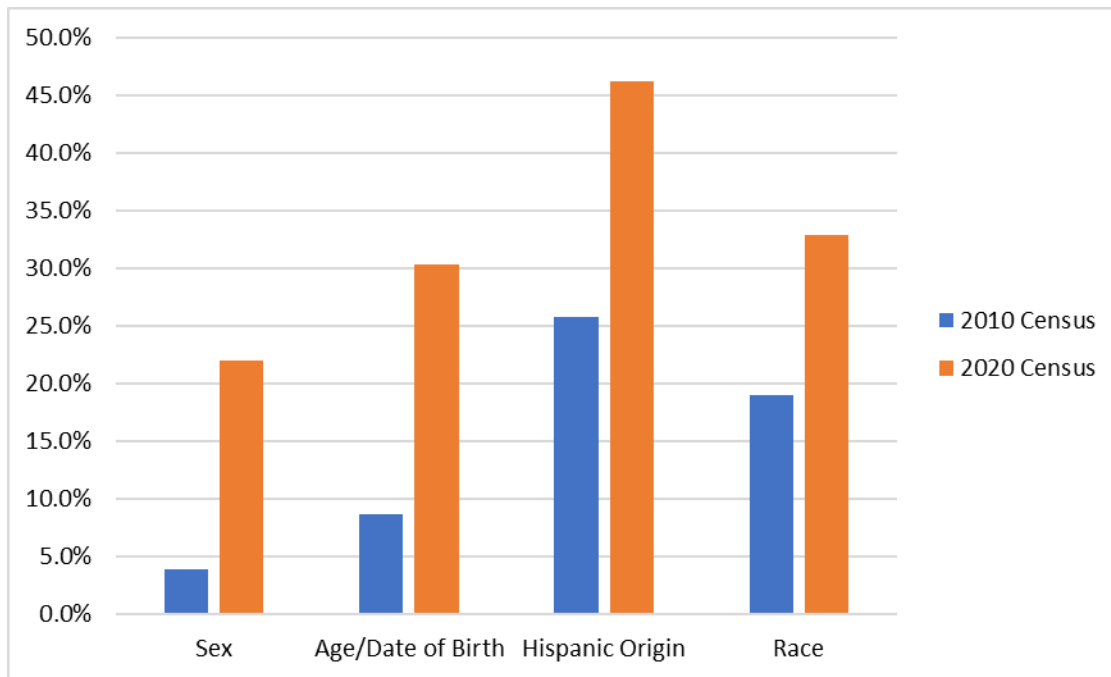
Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Unedited File.

**Figure 19. 2010 and 2020 Comparisons of Imputation Rates: Overall**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Edited File.

**Figure 20. 2010 and 2020 Comparisons of Imputation Rates: GQ Enumerations**



Source: U.S. Census Bureau, 2010 Decennial Census: Item Nonresponse and Imputation Assessment Report and 2020 Census Edited File.

## Appendix D: 2010 INR Rates Tables

**Table B1. 2010 Overall Item Nonresponse and Imputation Rates (Rothhaas, 2012)**

	Person-Level Items					Household -Level Items
	Relationship	Sex	Age/Date of Birth	Hispanic Origin	Race	Tenure
Item Nonresponse	1.5	1.5	3.5	3.9	3.3	4.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
“As Reported”	97.9	98.4	95.0	95.5	95.9	96.5
Imputed	2.1	1.6	5.1	4.5	4.1	3.5
Assigned	0.5	1.3	1.5	1.7	1.2	n/a
Allocated	1.7	0.3	3.6	2.8	2.9	3.5
Substituted	1.9 percent of all persons					

Source: U.S. Census Bureau, Census Unedited File and Census Edited File.

**Table B2. 2010 Census INR Rates for Household Items – National (Rothhaas, 2012)**

Form Type/Operation	Percent INR			
	Household Count	Undercount ****	Tenure	Phone Number
Overall	1.3	8.5	4.5	8.3
Self-Response	1.8	7.3	2.4	7.8
Enumerator Return	<0.1**	12.2	9.7	9.7***

Source: U.S. Census Bureau, Census Unedited File.

\*\*Enumerators were required to provide a response for household count regardless of respondent participation. Household count was automatically set for CFU and TQA returns so this cell includes only NRFU and ETL returns.

\*\*\* Telephone number is required for the CFU operation, so these cases are excluded from this cell.

\*\*\*\* Undercount is not asked in CFU but is passed through from the original form.

**Table B3. 2010 Census INR Rates for Person Items – National (Rothhaas, 2012)**

Form Type/Operation	Percent INR					
	Relationship	Sex	Age/Year of Birth	Hispanic Origin	Race	Overcount
Overall	1.5	1.5	3.5	3.9	3.3	2.3
Self-Response	1.1	1.7	0.8	4.2	3.3	1.4
Enumerator Return	2.4	1.0	10.0	3.3	3.4	4.9
GQ Enumeration	n/a	3.0	6.5	25.0	18.1	n/a

Source: U.S. Census Bureau, Census Unedited File.

n/a - item is not asked for this questionnaire type.

## Appendix E. 2020 Census Paper Questionnaire Sample

Images of pages 1, 2, 3, and 8 from the 2020 Census paper questionnaire are shown below. Page 8 is often referred to as the extended roster. Content from the paper questionnaire differed from the internet and NFRU instruments.

OMB No. 0607-1006; Approval Expires 11/30/2021

**United States<sup>®</sup>**  
**Census**  
**2020**

This is the official questionnaire for this address.  
It is quick and easy to respond, and your answers are protected by law.

U.S. DEPARTMENT OF COMMERCE  
Economics and Statistics Administration  
U.S. CENSUS BUREAU

FOR  
OFFICIAL  
USE ONLY

**Start here** OR go online at [my2020census.gov](https://my2020census.gov) to complete your 2020 Census questionnaire.  
Use a blue or black pen.

Before you answer Question 1, count the people living in this house, apartment, or mobile home using our guidelines.

- Count all people, including babies, who live and sleep here most of the time.
- If no one lives and sleeps at this address most of the time, go online at [my2020census.gov](https://my2020census.gov) or call the number on page 8.

The census must also include people without a permanent place to live, so:

- If someone who does not have a permanent place to live is staying here on April 1, 2020, count that person.

The Census Bureau also conducts counts in institutions and other places, so:

- Do not count anyone living away from here, either at college or in the Armed Forces.
- Do not count anyone in a nursing home, jail, prison, detention facility, etc., on April 1, 2020.
- Leave these people off your questionnaire, even if they will return to live here after they leave college, the nursing home, the military, jail, etc. Otherwise, they may be counted twice.

1. How many people were living or staying in this house, apartment, or mobile home on April 1, 2020?

Number of people =

2. Were there any additional people staying here on April 1, 2020 that you did not include in Question 1?

Mark ☒ all that apply.

- ☐ Children, related or unrelated, such as newborn babies, grandchildren, or foster children
- ☐ Relatives, such as adult children, cousins, or in-laws
- ☐ Nonrelatives, such as roommates or live-in babysitters
- ☐ People staying here temporarily
- ☐ No additional people

3. Is this house, apartment, or mobile home — Mark ☒ ONE box.

- ☐ Owned by you or someone in this household with a mortgage or loan? Include home equity loans.
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented?
- ☐ Occupied without payment of rent?

4. What is your telephone number?  
We will only contact you if needed for official Census Bureau business.

Telephone Number

-  -

FORM DI-Q1 (5-21-2019)

11800018

Person 1

**5. Please provide information for each person living here. If there is someone living here who pays the rent or owns this residence, start by listing him or her as Person 1. If the owner or the person who pays the rent does not live here, start by listing any adult living here as Person 1.**

**What is Person 1's name? Print name below.**

First Name MI

Last Name(s)

**6. What is Person 1's sex? Mark ☒ ONE box.**

☐ Male ☐ Female

**7. What is Person 1's age and what is Person 1's date of birth? For babies less than 1 year old, do not write the age in months. Write 0 as the age.**

Age on April 1, 2020 Print numbers in boxes. Month Day Year of birth

years

→ **NOTE: Please answer BOTH Question 8 about Hispanic origin and Question 9 about race. For this census, Hispanic origins are not races.**

**8. Is Person 1 of Hispanic, Latino, or Spanish origin?**

☐ No, not of Hispanic, Latino, or Spanish origin

☐ Yes, Mexican, Mexican Am., Chicano

☐ Yes, Puerto Rican

☐ Yes, Cuban

☐ Yes, another Hispanic, Latino, or Spanish origin – *Print, for example, Salvadoran, Dominican, Colombian, Guatemalan, Spaniard, Ecuadorian, etc.*

**9. What is Person 1's race?**

Mark ☒ one or more boxes **AND** print origins.

☐ White – *Print, for example, German, Irish, English, Italian, Lebanese, Egyptian, etc.*

☐ Black or African Am. – *Print, for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, etc.*

☐ American Indian or Alaska Native – *Print name of enrolled or principal tribe(s), for example, Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Native Village of Barrow, Inupiat Traditional Government, Nome Eskimo Community, etc.*

☐ Chinese ☒ Vietnamese ☐ Native Hawaiian


☒ Filipino ☐ Korean ☐ Samoan

☐ Asian Indian ☐ Japanese ☐ Chamorro

☐ Other Asian – *Print, for example, Pakistani, Cambodian, Hmong, etc.* ☐ Other Pacific Islander – *Print, for example, Tongan, Fijian, Marshallese, etc.*

☐ Some other race – *Print race or origin.*

→ **If more people were counted in Question 1 on the front page, continue with Person 2 on the next page.**



**1. Print name of Person 2**

First Name MI

Last Name(s)

**7. What is this person's race?**  
Mark ☒ one or more boxes **AND** print origins.

☐ White – Print, for example, German, Irish, English, Italian, Lebanese, Egyptian, etc. 2

☐ Black or African Am. – Print, for example, African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, etc. 2

☐ American Indian or Alaska Native – Print name of enrolled or principal tribe(s), for example, Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community, etc. 2

☐ Chinese ☐ Vietnamese ☐ Native Hawaiian

☐ Filipino ☐ Korean ☐ Samoan

☐ Asian Indian ☐ Japanese ☐ Chamorro

☐ Other Asian – Print, for example, Pakistani, Cambodian, Hmong, etc. 2

☐ Some other race – Print race or origin. 2

**2. Does this person usually live or stay somewhere else?**  
Mark ☒ all that apply.

☐ No

☐ Yes, for college

☐ Yes, for a military assignment

☐ Yes, for a job or business

☐ Yes, in a nursing home

☐ Yes, with a parent or other relative

☐ Yes, at a seasonal or second residence

☐ Yes, in a jail or prison

☐ Yes, for another reason

**3. How is this person related to Person 1? Mark ☒ ONE box.**

☐ Opposite-sex husband/wife/spouse

☐ Opposite-sex unmarried partner

☐ Same-sex husband/wife/spouse

☐ Same-sex unmarried partner

☐ Biological son or daughter

☐ Adopted son or daughter

☐ Stepson or stepdaughter

☐ Brother or sister

☐ Father or mother

☐ Grandchild

☐ Parent-in-law

☐ Son-in-law or daughter-in-law

☐ Other relative

☐ Roommate or housemate

☐ Foster child

☐ Other nonrelative

**4. What is this person's sex? Mark ☒ ONE box.**

☐ Male ☐ Female

**5. What is this person's age and what is this person's date of birth?** For babies less than 1 year old, do not write the age in months. Write 0 as the age.

Print numbers in boxes.

Age on April 1, 2020 Month Day Year of birth

years

→ **NOTE: Please answer BOTH Question 6 about Hispanic origin and Question 7 about race. For this census, Hispanic origins are not races.**

**6. Is this person of Hispanic, Latino, or Spanish origin?**

☐ No, not of Hispanic, Latino, or Spanish origin

☐ Yes, Mexican, Mexican Am., Chicano

☐ Yes, Puerto Rican

☐ Yes, Cuban

☐ Yes, another Hispanic, Latino, or Spanish origin – Print, for example, Salvadoran, Dominican, Colombian, Guatemalan, Spaniard, Ecuadorian, etc. 2

→ **If more people were counted in Question 1 on the front page, continue with Person 3 on the next page.**



<b>Use this section to complete information for the rest of the people you counted in Question 1 on the front page. We may call for additional information about them.</b>	
<b>Person 7</b>	
First Name <input type="text"/>	MI <input type="text"/>
Last Name(s) <input type="text"/>	
Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	Age on April 1, 2020 <input type="text"/> years
Date of Birth Month <input type="text"/> Day <input type="text"/> Year of birth <input type="text"/>	Related to Person 1? <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Person 8</b>	
First Name <input type="text"/>	MI <input type="text"/>
Last Name(s) <input type="text"/>	
Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	Age on April 1, 2020 <input type="text"/> years
Date of Birth Month <input type="text"/> Day <input type="text"/> Year of birth <input type="text"/>	Related to Person 1? <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Person 9</b>	
First Name <input type="text"/>	MI <input type="text"/>
Last Name(s) <input type="text"/>	
Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	Age on April 1, 2020 <input type="text"/> years
Date of Birth Month <input type="text"/> Day <input type="text"/> Year of birth <input type="text"/>	Related to Person 1? <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Person 10</b>	
First Name <input type="text"/>	MI <input type="text"/>
Last Name(s) <input type="text"/>	
Sex <input type="checkbox"/> Male <input type="checkbox"/> Female	Age on April 1, 2020 <input type="text"/> years
Date of Birth Month <input type="text"/> Day <input type="text"/> Year of birth <input type="text"/>	Related to Person 1? <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Thank you for completing your 2020 Census questionnaire.</b>	
<b>FOR OFFICIAL USE ONLY</b>	
JIC1 <input type="text"/> JIC2 <input type="text"/>	
If your enclosed postage-paid envelope is missing, please mail your completed questionnaire to:	
U.S. Census Bureau [Address Removed]	
If you need help completing this questionnaire, call toll-free 1-844-330-2020, Sunday through Saturday from 7:00 a.m. to 2:00 a.m. ET.	
TDD — Telephone display device for the hearing impaired. Call toll-free 1-844-467-2020, Sunday through Saturday from 7:00 a.m. to 2:00 a.m. ET.	
The U.S. Census Bureau estimates that completing the questionnaire will take 10 minutes on average. Send comments regarding this burden estimate or any other aspect of this burden to: Paperwork Reduction Project 0607-1006, U.S. Census Bureau, DCMD-2H174, 4600 Silver Hill Road, Washington, DC 20233. You may email comments to <2020.census.paperwork@cen.us.gov>. Use "Paperwork Reduction Project 0607-1006" as the subject.	
This collection of information has been approved by the Office of Management and Budget (OMB). The eight-digit OMB approval number 0607-1006 confirms this approval. If this number were not displayed, we could not conduct the census.	